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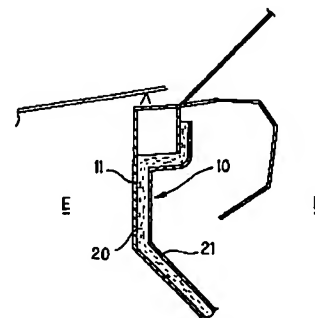
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(54)【発明の名称】 車両用防音材及びその製造方法

(57)【要約】

【課題】 セルロース系繊維物、粉砕物をベースとしたセルロース系基材の組成配合、目付、厚み等を変更することなく、遮音性能を高めた車両用防音材及びその製造方法を提供する。

【解決手段】 セルロース系繊維物、又は粉砕物をベースとした吸音・遮音成分と、この吸音・遮音成分を結合させる樹脂バインダとからなり、車体パネルの形状に合わせて成形されるセルロース系基材20と、このセルロース系基材20の表面側に高密度不織布21、あるいはフィルム22、又は基材20の表層に表面処理剤51を染み込ませて、紙粘土状に形成した高密度層20bを形成することにより、遮音性能を高める。また、セルロース系基材20の中間部分にリサイクル材の粉砕物等を素材とした高密度層25を配置することにより、多重壁遮音機能を付加して遮音性能を高める。



- 10 自動車用インシュレータダッシュ
- 11 ダッシュパネル
- 20 セルロース系基材 40, 41 成形用上下型
- 20a 低密度層 40a, 41a 真空・圧空換用孔
- 20b 高密度層
- 21 不織布 50 噴霧器
- 22 フィルム 51 表面処理剤
- 23 不織布
- 24 ホットメルト
- 25 高密度層(リサイクル粉砕物)
- 30 混合器
- 31 ベルトコンベア 52 搬送ロール
- 32 混合材料 60 容器
- 33 熱風加熱炉 61 粉砕物(リサイクル材)
- 34 ベルト M セルロース系底反マット
- 35 カット刃
- 36 熱風加熱炉
- 37, 38 コールドプレス成形用金型

## 【特許請求の範囲】

【請求項1】 セルロース系解繊物又は粉碎物をベースとした吸音・遮音成分と、該吸音・遮音成分を結合させる樹脂バインダとを素材として、車体パネルの形状に合わせて成形したセルロース系基材と、このセルロース系基材の表面側に高密度な表皮層が積層一体化されていることを特徴とする車両用防音材。

【請求項2】 高密度な表皮層は、高密度な不織布からなることを特徴とする請求項1に記載の車両用防音材。

【請求項3】 セルロース系原反マットと不織布とを重ね合わせて熱風加熱処理後、同時プレス成形することを特徴とする請求項2に記載の車両用防音材の製造方法。

【請求項4】 高密度な表皮層は、フィルムからなることを特徴とする請求項1に記載の車両用防音材。

【請求項5】 セルロース系原反マットとフィルムとをラミネートし、同時プレス成形する際、セルロース系原反マット側の成形型から真空吸引することにより、原反マットとフィルムを圧着することを特徴とする請求項4に記載の車両用防音材の製造方法。

【請求項6】 セルロース系原反マットとフィルムとをラミネートし、同時プレス成形する際、セルロース系原反マット側の成形型から圧空を供給してセルロース系原反マットを強制冷却するとともに、フィルム側の成形型から真空吸引することにより、成形体の厚みを確保することを特徴とする請求項4に記載の車両用防音材の製造方法。

【請求項7】 セルロース系解繊物又は粉碎物をベースとした吸音・遮音成分と、該吸音・遮音成分を結合させる樹脂バインダとを素材として、車体パネルの形状に合わせて成形したセルロース系基材の表面側に高密度な表面処理層が設けられていることを特徴とする車両用防音材。

【請求項8】 セルロース系原反マットの表面側に表面処理剤を含浸させ、含浸量を調整することにより、セルロース系基材の遮音性能を制御することを特徴とする請求項7に記載の車両用防音材の製造方法。

【請求項9】 セルロース系解繊物又は粉碎物をベースとした吸音・遮音成分と、該吸音・遮音成分を結合させる樹脂バインダとを素材として、車体パネルの形状に合わせて成形したセルロース系基材と、該セルロース系基材内部にリサイクル材からなる高密度層が介挿されていることを特徴とする車両用防音材。

【請求項10】 吸音・遮音成分と樹脂バインダとを混合した混合材料をマット状に堆積した後、リサイクル材の粉碎物を散布し、その後、上記混合材料を散布し、連続的、あるいは段階的に堆積させて複数層の原反マットを作製し、加熱軟化処理後、プレス成形することを特徴とする請求項9に記載の車両用防音材の製造方法。

【請求項11】 内部にリサイクル材からなる高密度層を介挿してなるセルロース系基材の表面側に高密度な表

皮層、あるいは高密度な表面処理層が設けられていることを特徴とする車両用防音材。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】この発明は、ダッシュパネルやフロアパネルに装着されるインシュレータダッシュ、フロアカーペット等に好適な車両用防音材及びその製造方法に係り、特に、廉価でかつ吸音性能に優れ、しかもリサイクルに適したセルロース系基材をベースとした多層構造体からなる車両用防音材に関する。

## 【0002】

【従来の技術】通常、車両には、走行時における静粛性を確保するために、各種防音材が設置されている。例えば、図16に示すように、エンジンルームEと車室Rとを区画するダッシュパネル1aの室内側には、インシュレータダッシュ1が装着されているとともに、車室R内のフロアパネル2aの室内面にフロアカーペット2が敷設されている。

【0003】また、エンジンルームE内には、ダッシュパネル1aの室内側に取り付けられるダッシュフロントインシュレータ3やフードパネル4aの室内側に取り付けられるフードインシュレータ4等が設置され、エンジンルームE内の音圧低下を図るとともに、ルーフパネル5aの室内面には、ルーフトリム5が装着されている。尚、図示はしないが、トランクルームやラゲージルーム内にはトランクトリム、ラゲージトリム、ホイールハウストリム等の防音性を有する内装材が設置されている。

【0004】このように、車室RやエンジンルームE、あるいはトランクルーム、ラゲージルーム内には各種防音材が設置されているが、その代表的なものとして、ダッシュパネル1aの室内面に装着されるインシュレータダッシュ1の構成について図17を基に説明する。このインシュレータダッシュ1としては、吸音・遮音性能を有する防音性基材6の表面側に遮音材7を一体化した二層構造のものが従来から知られている。

【0005】そして、遮音材7は、高密度の再生ゴムシートや再生塩ビシート等、重量の嵩むシート材料が使用されている。一方、防音性基材6の素材としては、ポリエチレンテレフタレート（以下、PETという）等のポリエステル繊維やその他の合成繊維をベースとして、低融点の熱融着性繊維や熱可塑性樹脂パウダー等の樹脂バインダを添加して、ニードリング加工や熱風をかけながらプレス加工を行なうことにより不織布マットを作製し、この不織布マットを加熱軟化処理後、コールドプレス成形することによりダッシュパネル1aの形状に合わせて防音性基材6を成形している。

【0006】また、別の従来例としては、反毛（毛を原料とする製品のぼろや屑のもつれを解きほぐして回収した羊毛、再生毛）を主繊維とし、これにバインダを添加して成形性を付与したフェルトを使用することもあり、

このフェルトは、同様に加熱軟化処理後、所要形状にコールドプレス成形することにより防音性基材6を成形している。

【0007】更に、型内にウレタン樹脂液を注入後、発泡成形により得られるウレタン発泡成形体を防音性基材6として使用する場合もある。

【0008】

【発明が解決しようとする課題】このように、上述したインシュレータダッシュ1の防音性基材6では、吸音性を高めるためには、基材6の厚みを厚肉にするか、あるいは目付量を多く設定するようにしているが、目付量を増大させると製品のコストアップに繋がり、また、目付量を一定のまま製品厚みを厚肉にした場合低密度となるため、ホコリが発生し易く、作業環境の悪化を招くという不具合があった。また、成形性も悪化して、高展開率部分で裂け易くなるという問題点があった。

【0009】更に、従来の不織布を使用した防音性基材6では、吸音性を高めるために細径の繊維質や細い繊維の融着性繊維の配合量を増やすと、これもまたコストアップに繋がるとともに、これらの繊維は基材を固める機能がないため、基材の剛性が損なわれるという問題点が指摘されている。

【0010】一方、フェルトを使用した場合、反毛は繊維が太いため、吸音性能の低下や製品の重量化を招くという不具合があった。また、ウレタン発泡体を使用した場合、コストダウンは期待できるものの、焼却の際、有害な窒素酸化物が発生し、またリサイクル面でも不利であるという問題点があった。

【0011】この発明は、このような事情に鑑みてなされたもので、インシュレータダッシュやフロアカーペット、フードインシュレータ等、広範囲に適用できる車両用防音材及びその製造方法であって、コストが廉価にもかかわらず、優れた吸音・遮音性能が期待でき、リサイクルにも好適な多層構造型の車両用防音材を提供することを目的としている。

【0012】

【課題を解決するための手段】上記目的を達成するために、この出願の請求項1に記載の発明は、セルロース系解繊物又は粉碎物をベースとした吸音・遮音成分と、該吸音・遮音成分を結合させる樹脂バインダとを素材として、車体パネルの形状に合わせて成形したセルロース系基材と、このセルロース系基材の表面側に高密度な表皮層が積層一体化されていることを特徴とする。

【0013】この出願の請求項2に記載の発明は、高密度な表皮層は、高密度な不織布からなることを特徴とする。

【0014】この出願の請求項3に記載の発明は、セルロース系原反マットと不織布とを重ね合わせて熱風加熱処理後、同時プレス成形することを特徴とする。

【0015】本発明の用途としては、インシュレータダ

ッシュ、フロアカーペット、フードインシュレータ、ダッシュフロントインシュレータ、ルーフトリム、トランクトリム等に適用できる。

【0016】ここで、吸音・遮音成分は、多孔質による吸音性能が得られるとともに、それ自体の剛性並びに重量により遮音性能が期待できる等、遮音性能と吸音性能の両者を発揮することができるという意味である。

【0017】そして、上記吸音・遮音成分として、セルロースからなる天然繊維、再生材、リサイクル材を使用し、例えば、純パルプ、再生セルロース、古紙（古新聞、古雑誌、段ボール等）を解繊、あるいは粉碎することによって得られる解繊物、あるいは粉碎物を使用する。

【0018】次いで、吸音・遮音成分を結合させる樹脂バインダは、熱可塑性樹脂タイプとして、低融点PET等の融着性繊維やPE（ポリエチレン）樹脂等の樹脂パウダー、あるいは反応性接着剤（例えば、ウレタン系樹脂接着剤）等が使用できる。また、熱硬化性樹脂タイプでは、フェノール樹脂等の熱硬化性樹脂が使用できる。

【0019】上記吸音・遮音成分と樹脂バインダとの配合比は、吸音・遮音成分／樹脂バインダ＝90：10～20：80の間に設定する。そして、用途により、ソフト感や吸音性能が要求されるときは吸音・遮音成分リッチに配合比を調整し、また、剛性や遮音性能が要求されるときは、樹脂バインダリッチに配合比をそれぞれ調整する。

【0020】更に、吸音・遮音成分に高融点合成繊維を添加しても良く、高融点合成繊維としては、PET、PP、PE、PA（ポリアミド樹脂）等で、繊維径が0.2～3.0デニールで繊維長さは2～80mm、好ましくは10～50mmのものが好ましい。

【0021】一方、高密度な表皮層としては、高密度合成繊維不織布、バインダリッチの高密度紙質不織布、ガラスや天然繊維の高密度不織布か、これに樹脂を含浸させたもの、あるいはゴムシート、塩ビシート等が使用できる。

【0022】更に、上記セルロース系基材と、表皮層の接着手段としては、セルロース系基材配合でのバインダリッチの場合、セルロース系原反マットと不織布を重ねた状態で熱風加熱や水蒸気加熱をするだけでバインダ成分により両者が接着される。また、熱ラミネート工法により両者を接着させても良い。

【0023】セルロース系基材配合でバインダリッチでない場合には、セルロース系原反マットと不織布とを別途接着剤を介して接着固定する。この接着剤としては、樹脂パウダー、パウダー状・ペレット状・チップ状・霧状・網目状・くもの巣状ホットメルト系接着剤、液状ホットメルトを糸状にしてランダム、あるいは網目状に塗布する。合成接着剤、あるいは天然物質由来の接着剤、また、セルロース系原反マットの表面に水で粘着性を付

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与することで両者を接着させても良い。その他にフィルム状ホットメルト系接着剤が使用できる。

【0024】次いで、セルロース系基材と表皮層とを一体化する方法としては、表皮層としてゴムシートなどの非通気性材料を使用する場合、セルロース系原反マットと表皮層とを別途加熱し、同時成形して貼り合わせる。

【0025】また、表皮層として、不織布などの通気性材料を使用する場合には、セルロース系原反マットと表皮層を同時加熱及び同時成形して貼り合わせるが、表皮層の通気抵抗が高い場合、あるいは表皮層とセルロース系原反マットの熱特性が大きく相違する場合はそれぞれ別途に加熱する必要がある。

【0026】次いで、セルロース系原反マットと表皮層をそれぞれ独立して成形する場合、両者を接着剤で貼り合わせれば良く、また、セルロース系原反マットと表皮層とをニードルパンチング加工により一体化すれば、接着剤を使用せずとも両者を固定できる。

【0027】そして、請求項1に記載の発明によれば、セルロース等の天然繊維、再生材、リサイクル材を主繊維として採用し、繊維径が細いものを選択的に使用すれば、吸音性能を高めることができるとともに、繊維状の解繊物、あるいは粉碎物が吸音・遮音成分であるため、表面積が大きく、吸音・遮音性能を高めることができ、しかも、樹脂バインダとの絡まりが強化され、剛性や強度もアップさせることができる。

【0028】更に、端材や使用後の製品を焼却及び再生することも可能であり、環境対策上も好ましく、吸音・遮音成分として、古紙など、廃品の解繊物、あるいは粉碎物を使用すれば、コスト的にも有利である。

【0029】また、防音性を有する内装部品の基材として使用する際、基材に要求される吸音・遮音性能に応じて、セルロース系解繊物、あるいは粉碎物をベースとした吸音・遮音成分と樹脂バインダとの配合比を適宜可変するか、あるいはセルロース系解繊物の繊維径又は粉碎物の粉碎径を選択することにより、用途に適した防音材が得られる。

【0030】更に、セルロース系基材の表面側に高密度な表皮層を積層するという構成であるため、セルロース系基材の配合、目付等を変更しなくて済み、高密度な表皮層による剛性や遮音性能の向上が期待できる。

【0031】次いで、この出願の請求項4に記載の発明は、高密度な表皮層は、フィルムからなることを特徴とする。

【0032】この出願の請求項5に記載の発明は、セルロース系原反マットとフィルムとをラミネートし、同時プレス成形する際、セルロース系原反マット側の成型型から真空吸引することにより、原反マットとフィルムを圧着することを特徴とする。

【0033】この出願の請求項6に記載の発明は、セルロース系原反マットとフィルムとをラミネートし、同時

プレス成形する際、セルロース系原反マット側の成型型から圧空を供給してセルロース系原反マットを強制冷却するとともに、フィルム側の成型型から真空吸引することにより、成形体の厚みを確保することを特徴とする。

【0034】ここで、フィルムとしては、20 $\mu$ m厚み以上のフィルム、又はホットメルトフィルムを使用するが、加熱中にフィルムが溶融落下するのを防止するために、フィルムに10g/m<sup>2</sup>以上の目付の不織布をラミネート処理するのが好ましい。

【0035】更に、セルロース系原反マットとフィルムとの接着性を強化させるためには、両者間にホットメルト層を介して接着固定すれば良く、また、ホットメルト層に替えて、水や接着剤等で処理しても良い。

【0036】また、セルロース系原反マットとフィルムとのラミネート工法としては、両者を同時加熱する方法として、セルロース系原反マットとフィルムをラミネート、あるいはタッカーやタグピンで仮止めして両者をラミネートするか、あるいは赤外加熱炉、あるいは恒温槽で材料を同時加熱した後、成形すると良い。

【0037】尚、セルロース系原反マットとフィルムを別途加熱する場合には、セルロース系原反マットを熱風加熱、フィルムを赤外加熱、あるいは恒温槽で加熱して重ね合わせて成形冷却すれば良い。

【0038】そして、請求項4に記載の発明によれば、セルロース系基材の表面側に非通気性のフィルムが貼着されているため、セルロース系基材の配合や目付を変更することなく、フィルムのもつ遮音性能を高め、かつホコリ成分の外部への飛散を防止することができる。

【0039】そして、請求項5に記載の発明によれば、セルロース系原反マットとフィルムは、プレス圧に加えて成形下型からの真空吸引力でフィルムが原反マット側に引き付けられ、両者が強固に接着する。

【0040】そして、請求項6に記載の発明によれば、セルロース系原反マット内に常温のエアや冷却用エアを吹き付けることで原反マットの冷却を速めることができるとともに、成形上型からの真空吸引力でフィルムが成形上型型面に追従するため、製品厚みを確保できる。

【0041】次いで、この出願の請求項7に記載の発明は、セルロース系解繊物又は粉碎物をベースとした吸音・遮音成分と、該吸音・遮音成分を結合させる樹脂バインダとを素材として、車体パネルの形状に合わせて成形したセルロース系基材の表面側に高密度な表面処理層が設けられていることを特徴とする。

【0042】更に、この出願の請求項8に記載の発明は、セルロース系原反マットの表面側に表面処理剤を含浸させ、含浸量を調整することにより、セルロース系基材の遮音性能を制御することを特徴とする。

【0043】ここで、セルロース系基材表面に形成される高密度な表面処理層は、セルロース系原反マット時にマット表面に水、水溶液、接着剤等の表面処理剤を噴霧

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処理、あるいはリッピング処理により、湿らせてその後乾燥させることにより、紙粘土状の高密度層が形成される。

【0044】また、搬送ロールと移動速度が同期しない速度で回転しているロールでマット表面を摩擦することにより、マット表面の処理剤がセルロース成分とよくなり、高密度化を促進させることができる。

【0045】表面処理剤として、水や水溶液及び接着剤が使用できるが、接着剤としては、合成接着剤、あるいは天然物質由来の接着剤、及び多糖類としては以下のものがある。

【0046】＜合成接着剤＞

- ・種々の有機系あるいは水性接着剤
- ・エマルジョン及びエマルジョン系接着剤

【0047】＜天然物質由来の接着剤及び多糖類など＞  
(海藻抽出物)

例) 寒天、カラギーナン

例) アルギン酸、アルギン酸ナトリウム及びアルギン酸化合物

(植物抽出物)

例) 澱粉、アミロペクチン、ペクチン、アラビアガム

例) ローカストビーンガム、グァーガム

(動物性蛋白)

例) ゼラチン、カゼイン

(セルロース系)

例) カルボキシメチルセルロース

例) メチルセルロース他セルロースに化学的に修飾したもの

(その他)

- ・タッキファイヤー(粘着付与材樹脂)
- ・ロジン(松脂)化合物
- ・アミロース、ペクチン酸、キシラン、アルギン酸繊維、蛋白質系繊維

【0048】そして、請求項7に記載の発明によれば、セルロース系基材の表層部分に含浸する樹脂や接着剤等の表面処理剤により、バインダリッチな状態であり、単一のセルロース系原反マットを使用して、吸音・遮音性能の異なる2つの層からなる基材を成形できるため、特に、低密度層と高密度層の振り分けにより、用途に応じた防音材を提供できる。

【0049】また、請求項8に記載の発明によれば、セルロース系原反マットの表面側に含浸させる処理剤の含浸量を調整することで、セルロース系基材における高密度層の厚みを制御できる。

【0050】次に、この出願の請求項9に記載の発明は、セルロース系解繊維物又は粉碎物をベースとした吸音・遮音成分と、該吸音・遮音成分を結合させる樹脂バインダとを素材として、車体パネルの形状に合わせて成形したセルロース系基材と、該セルロース系基材内部にリサイクル材からなる高密度層が介挿されていることを特

徴とする。

【0051】更に、この出願の請求項10に記載の発明は、吸音・遮音成分と樹脂バインダとを混合した混合材料をマット状に堆積した後、リサイクル材の粉碎物を散布し、その後、上記混合材料を散布し、連続的、あるいは段階的に堆積させて複数層の原反マットを作製し、加熱軟化処理後、プレス成形することを特徴とする。

【0052】また、この出願の請求項11に記載の発明は、内部にリサイクル材からなる高密度層を介挿してなるセルロース系基材の表面側に高密度な表皮層、あるいは高密度な表面処理層が設けられていることを特徴とする。

【0053】ここで、リサイクル材としては、内装材製造工程で生じる端材などの産業廃棄物、使用後の内装材、バンパー等の樹脂製外装材、また、自動車関係の廃材に限定されることなく、合成樹脂成形品等の一般廃棄物を使用しても良い。

【0054】そして、リサイクル材を定形、あるいは不定形に粉碎して使用するが、粉碎サイズは1～20mm平均の範囲が良いが、粉末状となっても良い。

【0055】更に、リサイクル材からなる高密度層がセルロース系基材の内部に強固に接着させるためにリサイクル材に樹脂パウダー、ホットメルトや粘着剤を添加しても良い。

【0056】そして、セルロース系基材内部にリサイクル材からなる高密度層を介挿する方法としては、セルロース系原反マット2枚でリサイクル材の高密度層をサンドイッチ状に多層状態にした後、加熱軟化処理後、プレス成形して、多層積層成形体を成形しても良く、また、セルロース系原反マット作製時に、マット堆積時にリサイクル材の層を介挿して、1枚の複層マットとした後、加熱軟化処理を行ない、コールドプレス成形しても良く、更に、セルロース系原反マット上の一面にリサイクル材を散布し、その後、セルロース系原反マットを更にもう1枚重ね合わせて、三層構造のものを加熱軟化処理後、コールドプレス成形して、多層積層体を成形しても良い。

【0057】また、リサイクル層の位置としては、セルロース系基材の中間でも良いが、いずれかの側、車体側か表面側に偏らせて介挿しても良い。

【0058】そして、請求項9に記載の発明によれば、セルロース系基材中にリサイクル材からなる高密度層が介挿されているため、このリサイクル材からなる高密度層により遮音機能が高まるため、セルロース系原反マットの配合や目付を変更することなく、良好な遮音機能が得られるため、優れた防音性能が得られる。

【0059】更に、請求項10に記載の発明によれば、吸音・遮音成分と樹脂バインダとの混合材料、及びリサイクル材の粉碎物の各材料を散布により堆積して複数層の原反マットを作製するというものであるから、セルロ

ース系基材及び高密度層の厚みや介挿位置を適宜調整でき、適切な吸音・遮音性能が得られる。

【0060】そして、請求項11に記載の発明によれば、車体パネルと高密度層と、セルロース系基材表面の高密度層の三者による三重壁遮音機能が得られ、セルロース系基材中の配合や目付量を変えることなく、良好な遮音機能が得られる。

【0061】

【発明の実施の形態】以下、本発明に係る車両用防音材並びにその製造方法の実施形態について、添付図面を参照しながら詳細に説明する。

【0062】図1乃至図5は本発明の第1実施形態を示すもので、図1は本発明に係る車両用防音材を適用した自動車用インシュレータダッシュの構成を示す断面図、図2は同自動車用インシュレータダッシュの製造方法を示す工程チャート図、図3は同自動車用インシュレータダッシュの製造方法の工程説明図、図4、図5は同自動車用インシュレータダッシュにおける不織布と原反マットとの貼合わせ工程の変形例を示す各チャート図である。

【0063】次いで、図6乃至図10は本発明の第2実施形態を示すもので、図6は本発明に係る車両用防音材を適用した自動車用インシュレータダッシュの構成を示す断面図、図7はセルロース系原反マットとフィルムとのラミネート状態を示す説明図、図8、図9は原反マットとフィルムとのラミネート工程の変形例を示す各チャート図、図10は図6に示すインシュレータダッシュの成形工程を示す説明図、図11は同成形工程における真空・圧空作用を示すタイムチャート図である。

【0064】次に、図12、図13は本発明の第3実施形態を示すもので、図12は自動車用インシュレータダッシュの構成を示す断面図、図13は同インシュレータダッシュの成形工程を示す工程説明図である。最後に図14、図15は本発明に係る車両用防音材の第4実施形態を示すもので、図14は自動車用インシュレータダッシュに適用した構成を示す断面図、図15は同インシュレータダッシュの製造方法の概要図である。

【0065】まず、図1乃至図5に基づいて、本発明の第1実施形態について説明する。

【0066】図1において、自動車用インシュレータダッシュ10は、エンジンルームEと車室Rとを区画するダッシュパネル11の室内面側に装着されており、セルロース系基材20の表面側に高密度の不織布21が積層一体化された二層構造体から構成されている。

【0067】上記セルロース系基材20は、樹脂バインダで結合させた吸音・遮音成分をベースとして構成されている。上記吸音・遮音成分としては、セルロース系成分であり、具体的には、純パルプ、再生セルロース、古紙（古新聞、古雑誌、段ボール等）や、木材など植物、また、化学的に修飾・加工したセルロース類、製紙工業

等で発生する天然素材由来の産業廃棄物（ヘドロ状であったり湿っていたりしても良い）を必要に応じ乾燥させたものなどを使用し、これらを解繊、あるいは粉碎することによって繊維状又は粉末状となっている。

【0068】一方、樹脂バインダとしては、低融点PETからなる熱融着性繊維、ポリエチレン樹脂等の樹脂パウダーや反応性接着剤（例えばウレタン系接着剤）が使用でき、この実施形態においては、古紙を解繊処理した粉碎物に低融点PETを素材とした熱融着性繊維を樹脂バインダとして使用している。

【0069】そして、吸音・遮音成分と樹脂バインダとの配合比は、吸音・遮音成分／樹脂バインダ＝90：10～20：80の範囲内に設定すれば良いが、この配合比の設定については、例えば吸音性能やソフト感が要求される用途には、吸音・遮音成分リッチな配合とし、剛性や遮音性能が要求される用途には、樹脂バインダリッチな配合比を適宜選択することにより、セルロース系基材20の使用範囲を大幅に広げることができる。

【0070】上記インシュレータダッシュ10の遮音材12裏面に積層されるセルロース系基材20としては、吸音・遮音成分／樹脂バインダ＝80：20でセルロース系基材20の面密度並びに平均厚みはそれぞれ1,000g/m<sup>2</sup>、20mmに設定されている。

【0071】従って、このセルロース系基材20は、セルロース等の天然素材、再生材、リサイクル材をベースとして採用する構成であるため、繊維径や粉碎物が細径のものを使用すれば、吸音性能を高めることができ、また、端材や使用後の製品を焼却可能、再生可能とでき、特に、古紙など廃品の解繊品、あるいは粉碎品を使用すれば、コスト的にも非常に有利である。

【0072】また、シュレッダー等で得られる紐状とは異なり、表面積が大きいため、吸音・遮音性能が高く、樹脂バインダとの絡まりが強まるため、製品の強度を高めることもできる。

【0073】更に、吸音・遮音成分の吸音性能を特に高めるために、高融点繊維を添加することも可能であり、その場合、高融点繊維としては、高融点PET、PP、PE、PA（ポリアミド樹脂）などの合成繊維から適宜選択でき、繊維径が0.2～30デニール、繊維長さが2～80mm（好ましくは10～64mm）の高融点合成繊維を添加すれば、吸音性能を高めることができる。

【0074】一方、セルロース系基材20の表面に積層される不織布21は、PET、PP、PE、PA（ポリアミド樹脂）等、高密度合成繊維不織布、バインダリッチの高密度紙質不織布、ガラスや天然繊維の不織布か、これに樹脂を含浸させたもの等が使用できる。

【0075】そして、この不織布21は、遮音性及び剛性を強化させるために、高密度であることが必要であり、面密度としては、50～300g/m<sup>2</sup>が適している。



【0076】従って、図1に示す自動車用インシュレータダッシュ10は、高密度な不織布21により遮音性、剛性が強化されているため、セルロース系基材20の目付や厚みをそれ程多く設定する必要がないため、コストアップを回避できるとともに、この不織布21により、セルロース系基材20からホコリ成分が車室内に飛散することがなく、車室内の環境衛生上も好ましい。

【0077】次に、上記自動車用インシュレータダッシュ10の製造方法について、図2乃至図5に基づいて詳細に説明する。

【0078】まず、図2のチャート図に示すように、吸音・遮音成分と樹脂バインダとを混合した混合材料を圧縮しながら加熱する工程を経てマット状に形成し、所定寸法毎に裁断して、セルロース系原反マットMを作製し、このセルロース系原反マットM中の樹脂バインダの配合比が多い場合には、セルロース系原反マットMと不織布21を重ね合わせて加熱軟化処理後、同時プレス成形すれば良い。

【0079】すなわち、この工程を図3を基に具体的に説明すると、混合器30内に吸音・遮音成分と樹脂バインダとが投入され、混合操作した後、ベルトコンベア31上に混合材料32が散布され、加熱炉33内でプーリー34aにより循環駆動されるベルト34により混合材料32にプレス圧をかけながら熱風が吹き付けられて、樹脂バインダが溶融して、吸音・遮音成分同士を結合させる。そして、所定厚みのマットが作製され、カット刃35により所定寸法ずつ裁断されて、セルロース系原反マットMが作製される。

【0080】そして、不織布21とセルロース系原反マットMとを重ね合わせて熱風加熱炉36内にセットして、熱風を吹き付ければ、このときの樹脂バインダの融着作用により、セルロース系原反マットMに不織布21が接着し、コールドプレス成形用金型37、38の型締めにより、図1に示す形状のインシュレータダッシュ10が成形される。尚、このとき、熱風加熱炉36内で熱風の排出側に不織布21を配置すれば、熱風加熱炉36内にホコリ成分が飛び散ることがない。

【0081】従って、従来の成形設備を使用して、不織布21の通気性を利用して一体成形が可能であり、特に、セルロース系原反マットM中の樹脂バインダのバインダ作用を利用すれば、不織布21を別途加熱する必要がなく、図1に示すインシュレータダッシュ10を簡単に成形できる。

【0082】尚、図2、図3に示すように、熱風加熱によりバインダ成分で両者を接着する以外に熱ラミネート工法で両者を一体化して、同時プレス成形しても良い。

【0083】また、セルロース系原反マットM中の樹脂バインダの配合比が少ない場合には、なんらかの接着手段をとれば良い。この接着手段としては、例えば、樹脂パウダー、パウダー状・ペレット状・チップ状・霧状・

網目状・くもの巣状ホットメルト系接着剤を散布、あるいはセットして両者を接着させるか、液状ホットメルトを糸状にしてランダム、あるいは網目状に接着面となる面に塗布しても良い。また、合成接着剤、あるいは天然物質由来の接着剤で両者を接着しても良い。

【0084】更に、セルロース系原反マットM中のセルロース成分が親水基を有し、粘着性が生じる性質を利用して、マットM表層部分に水等を噴霧するか、あるいはフィルム状ホットメルトにより両者を接着しても良い。

【0085】また、参考までに、通気性を有する不織布21以外に非通気性のゴムシート等の表皮を使用する場合には、図4に示すように、セルロース系原反マットMと表皮とを別々に加熱し、同時成形すれば良く、図5に示すように、セルロース系原反マットMと表皮を別々に成形し、上述したホットメルトや接着剤で貼り合わせても良い。

【0086】次いで、図6乃至図10に基づいて、本発明に係る車両用防音材並びにその製造方法の第2実施形態について説明する。

【0087】この第2実施形態においても、自動車用インシュレータダッシュ10に適用したもので、図6に示すように、ダッシュパネル11の室内側に装着される自動車用インシュレータダッシュ10は、セルロース系基材20とセルロース系基材20の表面側にフィルム22が一体化された二層構造体から構成されている。

【0088】上記セルロース系基材20の構成及びその作用については、第1実施形態と同一であるので、ここでは省略する。そして、このセルロース系基材20の表面側に一体化されるフィルム22は、20 $\mu$ m以上のフィルム又はホットメルトフィルムを使用する。

【0089】従って、図6に示すインシュレータダッシュ10においても、セルロース系基材20の表面側に遮音性に富むフィルム22が一体化されているため、セルロース系基材20における配合や目付量を変更することなく、コストアップを回避して、良好な遮音性能、吸音性能が期待できる。

【0090】また、高密度な不織布21同様、フィルム22により成形工程中に加熱炉36内にホコリ成分が飛散したり、車室内に飛散することがなく、作業環境や車室内の環境衛生を良好に保つことができる。

【0091】次いで、図7に示すように、セルロース系基材20の表面側に一体貼着するフィルム22は、加熱軟化時、フィルム22が解け落ちてしまわないように表面側に不織布23を一体化するのが好ましく、この不織布23は、10g/m<sup>2</sup>以上の面密度が必要である。

【0092】また、セルロース系基材20とフィルム22との接着性を強固にするためには、フィルム22のセルロース系原反マットM対向側にホットメルト24をラミネートするのが良く、このホットメルト24は、基材20側に設けても良い。尚、セルロース系原反マットM

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の表面側を接着剤や水溶液などで処理して、フィルム22との接着力を高めるようにしても良い。

【0093】次に、セルロース系基材20とフィルム22との一体化工程は、図8に示すように、セルロース系原反マットMとフィルム22とをラミネート、あるいは仮止めした後、加熱し、プレス加工により図6に示すセルロース系基材20とフィルム22とを一体化しても良く、この場合、セルロース系原反マットMとフィルム22とはラミネート、あるいはタッカーやタグピンで仮止めすれば良く、加熱工程は、赤外加熱炉、あるいは恒温槽で同時加熱が可能である。

【0094】同様に、図9に示すように、セルロース系原反マットMを熱風加熱する一方、フィルム22を赤外加熱炉、あるいは恒温槽で加熱し、両者を合わせて成形、冷却して、図6に示すインシュレータダッシュ10を成形することもできる。

【0095】また、非通気性のフィルム22を使用することに着目し、図10に示すように、真空・圧空機構を付設した成形用上下型（上型40、下型41とする）を使用して成形サイクルを短縮化することもできる。

【0096】すなわち、上下型40、41には、それぞれ真空・圧空兼用孔40a、41aが開設されており、セルロース系基材20とフィルム22との接着性を高めるために、下型41の真空・圧空兼用孔41aから真空吸引して、フィルム22をセルロース系基材20側に付勢力を作用させる。また、製品の厚みを充分確保するためには、上型40の真空・圧空兼用孔40aを通して真空吸引し、上下型40、41のクリアランスに相当する厚みを確保して、製品板厚を忠実に確保することができる。

【0097】また、成形（冷却）時間を短縮するために、冷却水で上下型40、41を常に低温に保っておくか、下型41の真空・圧空兼用孔41aを通じて冷却用エア（室温、あるいは低温）をセルロース系基材20内部に吹き込んで、セルロース系基材20を急冷して、成形サイクルを高めるようにしても良い。

【0098】この上下型40、41による真空吸引機構及び圧空機構のタイムチャートを図11に示すように、上下型40、41の型締め後、まず、下型41に真空吸引力を作用させ、セルロース系基材20とフィルム22との接着力を高めた後、下型41の真空・圧空兼用孔41aから冷却用エアを基材20中に供給して、冷却サイクルを短縮化させるとともに、成形上型40の真空・圧空兼用孔40aから真空吸引して、製品板厚の確保を同時に行なう。更に製品の脱型性を高めるために成形上型40の真空・圧空兼用孔40aから圧空を作用させて脱型性を高めるようにしても良い。

【0099】次に、図12、図13は、本発明の第3実施形態を示すもので、図12に示すように、この実施形態における自動車用インシュレータダッシュ10にお

るセルロース系基材20は、吸音性能に優れた低密度層20aと遮音性能に優れた高密度層20bとの二層構造に形成されていることが特徴である。

【0100】そして、セルロース系基材20の材料構成は上述した実施形態と同一であり、特に、セルロース系基材20の特徴部分は低密度層20aに生かされているが、この高密度層20bについては以下のような手順で形成されている。

【0101】すなわち、図13に示すように、セルロース系原反マットMの一面に噴霧器50により水、水溶液、接着剤等の表面処理剤51を噴霧、あるいは塗布し、搬送ロール52により上記表面処理剤51を原反マットMの表層部分になじませ、その後、乾燥工程で乾燥させて紙粘土状の高密度層20bを形成する。

【0102】尚、搬送ロール52は、次期乾燥工程に原反マットMを移動させるが、原反マットMの移動速度と同期しない速度で回転するか、逆回転する搬送ロール52aと原反マットM表面との摩擦力を高めて表面処理剤51をよくなじませ、高密度化を促進させるようにしても良い。

【0103】上記表面処理剤51の接着剤としては、以下のものが挙げられる。

【0104】＜合成接着剤＞

- ・種々の有機系あるいは水性接着剤
- ・エマルジョン及びエマルジョン系接着剤

【0105】＜天然物質由来の接着剤及び多糖類など＞  
（海藻抽出物）

例）寒天、カラギーナン

例）アルギン酸、アルギン酸ナトリウム及びアルギン酸化合物

（植物抽出物）

例）澱粉、アミロペクチン、ペクチン、アラビアガム

例）ローカストビーンガム、グァーガム

（動物性蛋白）

例）ゼラチン、カゼイン

（セルロース系）

例）カルボキシメチルセルロース

例）メチルセルロース他セルロースに化学的に修飾したもの

（その他）

- ・タッキファイヤー（粘着付与材樹脂）
- ・ロジン（松脂）化合物
- ・アミロース、ペクチン酸、キシラン、アルギン酸繊維、蛋白質系繊維

【0106】従って、この第3実施形態におけるインシュレータダッシュ10においては、セルロース系基材20は、低密度層20aと高密度層20bとから構成されており、素材となるセルロース系原反マットMの目付量や厚み等を変更することなく、低密度層20aで良好な吸音性能、高密度層20bで良好な遮音性能が得られ、



かつ高密度層20bによりホコリ成分が外部に飛散するのを防止できるため、環境上も好ましい。また、処理剤51の含浸量を適宜調整することにより、吸音性能と遮音性能のバランスを適切に調整することができる。

【0107】次に、図14、図15は、本発明の第4実施形態を示すもので、図14に示すように、ダッシュパネル11の室内面側に装着される自動車用インシュレータダッシュ10は、第1実施形態の構成、すなわちセルロース系基材20の表面側に高密度の不織布21が一体化された二層積層体に加えて、セルロース系基材20の内部に中間層としてリサイクル材を素材とした高密度層25が設けられている。

【0108】この高密度層25の素材となるリサイクル材としては、内装材製造工程で生じる端材等の産業廃棄物、使用後の内装材、外装材等の粉碎物、また、自動車関係の廃材に限らず合成樹脂成形品などの一般廃棄物を使用しても良い。但し、布地のような低密度品は性能向上の効果がないため適していない。

【0109】また、リサイクル材を定形、あるいは不定形に粉碎して使用し、粉碎サイズは1～20mmの範囲が適しているが、粉碎設備の能力上、粉末状のリサイクル材が混入しても問題ない。

【0110】更に、セルロース系基材20とリサイクル材の粉碎物からなる高密度層25との接着性を強化するために、リサイクル材に樹脂パウダー、ホットメルト（パウダー状・ペレット状・チップ状）や上述した表面処理剤51を添加しても良い。

【0111】次いで、セルロース系基材20の中間部に高密度層25を介挿する方法として、図15(a)に示すように、2枚のセルロース系原反マットMの間にリサイクル材を素材とした高密度層25を挟み込んで加熱軟化処理後、コールドプレス成形しても良い。この高密度層25は容器60からリサイクル材の粉碎物61を散布して形成される。

【0112】また、図15(b)に示すように、原反マットMの製造工程でベルトコンベア31上に混合器30から吸音・遮音成分と樹脂バイндаとを混合した混合材料32を堆積した後、容器60からリサイクル材を粉碎した粉碎物61を散布し、その後、その上側から混合器30を通じて混合材料32を散布して、これらを連続的、あるいは段階的に堆積させて、1枚の複層マットとしても良い。

【0113】更に、プレス直前に成形機内にセルロース系原反マットMをセットし、リサイクル材を散布し、更にもう1枚のセルロース系原反マットMを重ねてプレス成形しても良い。尚、高密度層25はセルロース系基材20の中間位置でも、また、いずれかの側に偏らせて設けても良い。

【0114】そして、このようにセルロース系基材20内部に高密度層25を配置すれば、例えば、ダッシュパ

ネル11と高密度層25及び高密度の不織布21の三者による三重壁遮音機能が得られ、セルロース系基材20の配合や目付を変化させることなく良好な遮音機能が得られる。

【0115】そして、高密度層25の目付量等を適宜変更することにより、遮音性能を可変でき、このこともきめ細かな吸音・遮音性能を選択できることになる。

【0116】また、不織布21を廃止した構成でも良く、不織布21に替えてフィルム22や、あるいは表面に高密度層20bを形成した構成を採用しても良い。

【0117】

【発明の効果】以上説明した通り、本発明に係る車両用防音材は、セルロース系解繊物、あるいは粉碎物をベースとした吸音・遮音成分と、この吸音・遮音成分を結合させる樹脂バイндаとをベースとしたセルロース系基材を使用することにより、安価で高性能、かつ環境対策にも好適であるという作用効果に加えて、このセルロース系基材の表面側に高密度な不織布、あるいはフィルムを積層一体化するか、あるいはセルロース系基材の表面側に高密度な表面処理層を形成することにより、セルロース系基材のグレードをアップさせることなく、また、目付や板厚を増大させることなく、廉価で良好な吸音性能を維持した状態で遮音性能を高めることができるという効果を有する。

【0118】更に、セルロース系基材に通気性を有する高密度不織布を一体化する際、セルロース系原反マットの樹脂バイндаの接着性を利用すれば、同時加熱、同時プレスが可能となり、廉価に成形でき、かつセルロース系基材の表面にフィルムを積層する際、真空吸引力及び圧空力を併用すれば、強固な接着力をもち、かつ製品板厚を忠実に再現できる成形性の良好な車両用防音材が製造できる等の作用効果を有する。

【0119】そして、セルロース系基材の表面側に表面処理剤を含浸させて高密度層を形成するという方法によれば、処理剤を適宜選択し、かつ含浸量を調整することにより、必要とする遮音性能をコントロールすることができ、きめ細かな防音対策に有利であるという効果を有する。

【0120】また、セルロース系基材内に高密度層を設定すれば、多重壁遮音機能が得られ、遮音機能を飛躍的に向上させた車両用防音材を提供することができるという効果を有する。

【図面の簡単な説明】

【図1】本発明に係る車両用防音材の第1実施形態を用いた自動車用インシュレータダッシュの構成を示す断面図である。

【図2】図1に示す自動車用インシュレータダッシュの製造方法の一実施形態を示すチャート図である。

【図3】図2に示すチャート図の工程説明図である。

【図4】図2に示すチャート図におけるラミネート工程

の変形例を示すチャート図である。

【図5】図2に示すチャート図におけるラミネート工程の変形例を示すチャート図である。

【図6】本発明に係る車両用防音材の第2実施形態を適用した自動車用インシュレータダッシュの構成を示す断面図である。

【図7】図6に示す自動車用インシュレータダッシュに使用するフィルムの構成を示す説明図である。

【図8】図6に示す自動車用インシュレータダッシュにおける原反マットとフィルムとの一体成形の変形例を示すチャート図である。

【図9】図6に示す自動車用インシュレータダッシュにおける原反マットとフィルムとの一体成形の変形例を示すチャート図である。

【図10】図6に示す自動車用インシュレータダッシュの成形工程を示す説明図である。

【図11】図10に示す成形工程における成形上下型のタイムチャート図である。

【図12】本発明に係る車両用防音材の第3実施形態を適用した自動車用インシュレータダッシュの構成を示す断面図である。

【図13】図12に示す自動車用インシュレータダッシュの製造方法の概要を示す説明図である。

【図14】本発明に係る車両用防音材の第4実施形態を適用した自動車用インシュレータダッシュの構成を示す断面図である。

【図15】図14に示す自動車用インシュレータダッシュにおける原反マットと高密度層とのラミネート工程を示す説明図である。

【図16】車両用防音材の設置箇所を示す説明図であ

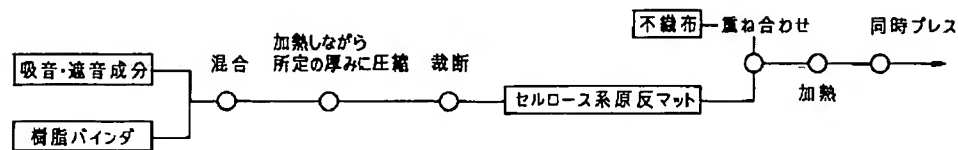
＊る。

【図17】従来の自動車用インシュレータダッシュの構成を示す断面図である。

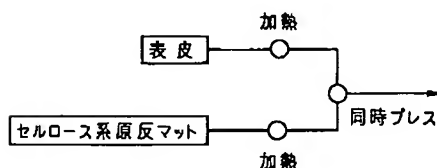
【符号の説明】

- 10 自動車用インシュレータダッシュ
- 11 ダッシュパネル
- 20 セルロース系基材
- 20a 低密度層
- 20b 高密度層
- 21 不織布
- 22 フィルム
- 23 不織布
- 24 ホットメルト
- 25 高密度層（リサイクル粉碎品）
- 30 混合器
- 31 ベルトコンベア
- 32 混合材料
- 33 熱風加熱炉
- 34 ベルト
- 35 カット刃
- 36 熱風加熱炉
- 37, 38 コールドプレス成形用金型
- 40, 41 成形用上下型
- 40a, 41a 真空・圧空兼用孔
- 50 噴霧器
- 51 表面処理剤
- 52 搬送ロール
- 60 容器
- 61 粉碎物（リサイクル材）
- \*30 M セルロース系原反マット

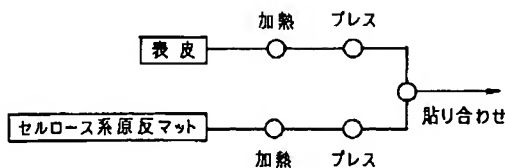
【図2】



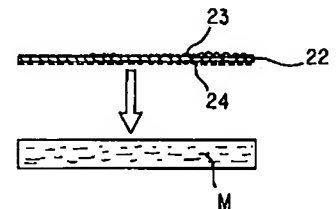
【図4】



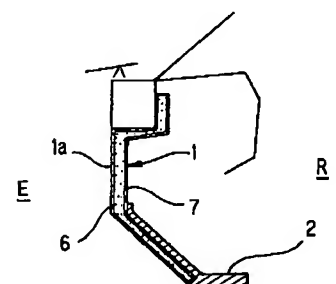
【図5】



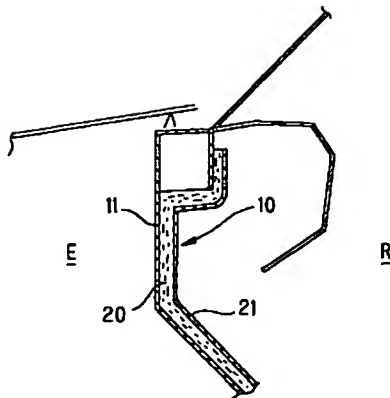
【図7】



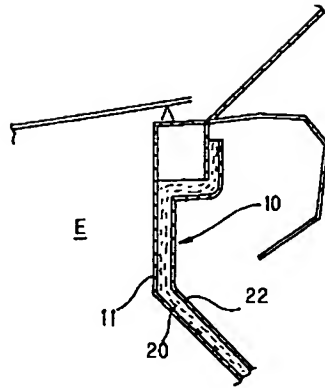
【図17】



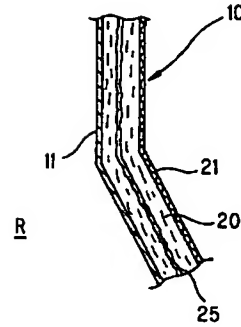
【図1】



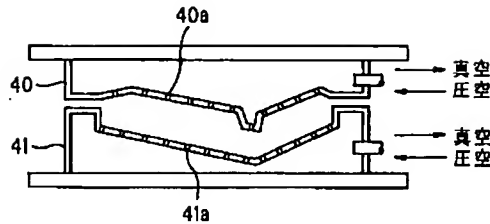
【図6】



【図14】

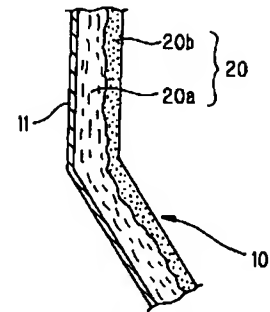


【図10】

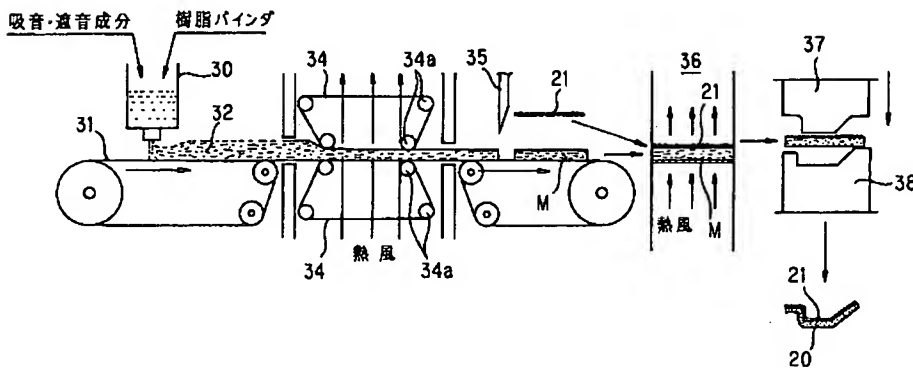


- 10 自動車用インシュレータダッシュ  
 11 ダッシュパネル  
 20 セルローズ系基材  
 20a 低密度層  
 20b 高密度層  
 21 不織布  
 22 フィルム  
 23 不織布  
 24 ホットメルト  
 25 高密度層(リサイクル粉砕品)  
 30 混合器  
 31 ベルトコンベア  
 32 混合材料  
 33 熱風加熱炉  
 34 ベルト  
 35 カット刃  
 36 熱風加熱炉  
 37, 38 コールドプレス成形用金型
- 40, 41 成形用上下型  
 40a, 41a 真空・圧空兼用孔  
 50 噴霧器  
 51 表面処理剤  
 52 搬送ロール  
 60 容器  
 61 粉砕物(リサイクル材)  
 M セルローズ系原反マット

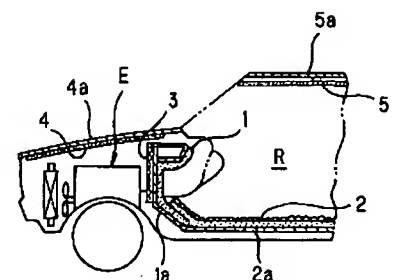
【図12】



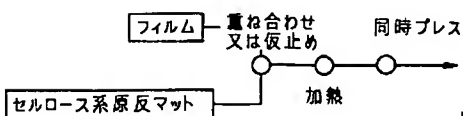
【図3】



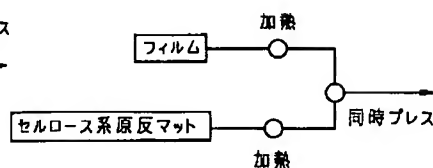
【図16】



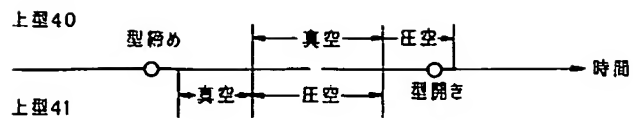
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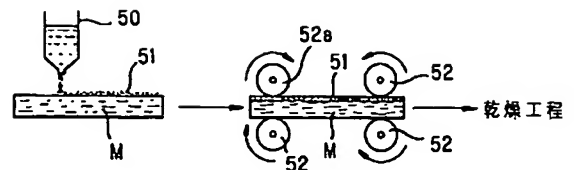
【図9】



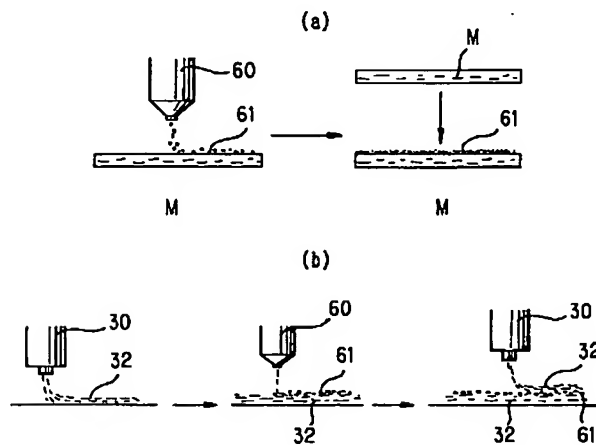
【図11】



【図13】



【図15】



フロントページの続き

(51)Int.Cl.<sup>7</sup>

B 2 9 L 9:00  
31:58

識別記号

F I

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31:58

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DG10A DG15B EC052 EJ202  
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AH26 MA01 MA02 MA03 MA05  
MB01 MG04 MH06

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[Claim(s)]

[Claim 1] the sound insulating material for cars characterize by carry out the laminating unification of the high-density epidermis layer at the front face side of the cellulose system base material fabricated according to the configuration of a car body panel , and this cellulose system base material by be made from absorption of sound / noise insulation component which used the cellulose system fiberized material or the grinding object as the base , and the resin binder which combine this absorption of sound / noise insulation component .

[Claim 2] A high-density epidermis layer is a sound insulating material for cars according to claim 1 characterized by consisting of a high-density nonwoven fabric.

[Claim 3] The manufacture approach of the sound insulating material for cars according to claim 2 characterized by piling up a cellulose system original fabric mat and a nonwoven fabric, and carrying out coincidence press forming after hot blast heat-treatment.

[Claim 4] A high-density epidermis layer is a sound insulating material for cars according to claim 1 characterized by consisting of a film.

[Claim 5] The manufacture approach of the sound insulating material for cars according to claim 4 characterized by sticking an original fabric mat and a film by pressure by carrying out vacuum suction from the die by the side of a cellulose system original fabric mat in case coincidence press forming of a cellulose system original fabric mat and the film is laminated and carried out.

[Claim 6] The manufacture approach of the sound insulating material for cars according to claim 4 characterized by securing the thickness of a Plastic solid by carrying out vacuum suction from the die by the side of a film while supplying a compressed air from the die by the side of a cellulose system original fabric mat and carrying out forced cooling of the cellulose system original fabric mat, in case coincidence press forming of a cellulose system original fabric mat and the film is laminated and carried out.

[Claim 7] the sound insulating material for cars characterize by prepare the high-density surface treatment layer in the front face side of the cellulose system base material fabricated according to the configuration of a car body panel by be made from absorption of sound / noise insulation component which used the cellulose system fiberized material or the grinding object as the base , and the resin binder which combine this absorption of sound / noise insulation component .

[Claim 8] The manufacture approach of the sound insulating material for cars according to claim 7 characterized by controlling the noise insulation engine performance of a cellulose system base material by infiltrating a finishing agent into the front-face side of a cellulose system original fabric mat, and adjusting the amount of sinking in.

[Claim 9] the sound insulating material for cars characterize by insert the high density layer which consist of a recycle material in the interior of the cellulose system base material fabricated according to the configuration of a car body panel , and this cellulose system base material by be made from absorption of sound / noise insulation

component which used the cellulose system fiberized material or the grinding object as the base , and the resin binder which combine this absorption of sound / noise insulation component .

[Claim 10] The manufacture approach of the sound insulating material for cars according to claim 9 which sprinkle the grinding object of recycle material , sprinkle the above-mentioned charge of an admixture after that , be make to accumulate continuously or gradually , produce the original fabric mat of two or more layers , and be characterize by carry out press forming after heating softening processing after deposit the charge of an admixture which mixed absorption of sound / noise insulation component and the resin binder in the shape of a mat .

[Claim 11] The sound insulating material for cars characterized by preparing the high-density epidermis layer or the high-density surface treatment layer in the front-face side of the cellulose system base material which comes to insert in the interior the high density layer which consists of recycle material.

## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the suitable sound insulating material for cars for an insulator dash, a floor carpet, etc. with which a dash panel and a floor panel are equipped, and its manufacture approach, especially, it is cheap, and is excellent in the absorption-of-sound engine performance, and relates to the sound insulating material for cars which consists of a multilayer-structure object which used as the base the cellulose system base material which moreover fitted recycle.

[0002]

[Description of the Prior Art] Usually, in order to secure the silence at the time of transit, various sound insulating materials are installed in the car. For example, as shown in drawing 16 , while the interior-of-a-room side of dash panel 1a which divides an engine room E and the vehicle room R is equipped with the insulator dash 1, the floor carpet 2 is laid by the indoor side of floor panel 2a in the vehicle room R.

[0003] Moreover, while the hood insulator 4 grade attached in the interior-of-a-room side of the dash front insulator 3 attached in the interior-of-a-room side of dash panel 1a or hood panel 4a is installed in an engine room E and aiming at the sound pressure fall in an engine room E, the indoor side of roof panel 5a is equipped with the roof trim 5. In addition, although illustration is not carried out, in the trunk room or the luggage room, the interior material which has soundproofing, such as a trunk trim, a luggage trim, and a wheel house trim, is installed.

[0004] Thus, although various sound insulating materials are installed in the vehicle room R, the engine room E or the trunk room, and the luggage room, the configuration of the insulator dash 1 with which the indoor side of dash panel 1a is equipped is explained based on drawing 17 as the typical thing. The thing of the two-layer structure which united the insulator 7 with the front-face side of the soundproof base material 6 which has absorption-of-sound / noise insulation engine performance as this insulator dash 1 is known from the former.

[0005] And as for the insulator 7, the sheet material of weight, such as a playback



rubber sheet, a playback vinyl chloride sheet, etc. of high density, with which it increases is used. On the other hand as a material of the soundproof base material 6, polyester fiber, such as polyethylene terephthalate (henceforth PET), and other synthetic fibers are used as the base. Resin binders, such as thermal melting arrival nature fiber of a low-melt point point and thermoplastics powder, are added. Applying needling processing and hot blast, by performing press working of sheet metal, a nonwoven fabric mat is produced and the soundproof base material 6 is fabricated according to the configuration of dash panel 1a by carrying out cold press molding of this nonwoven fabric mat after heating softening processing.

[0006] moreover , since the felt which made the main fiber a recovered wool ( wool and the playback hair which unraveled and collected the tangles of the rug of a product and waste which use hair as a raw material ) , added the binder to this , and gave the moldability as another conventional example use , this felt be fabricate the soundproof base material 6 by carry out cold press molding to a necessary configuration after heating softening processing similarly .

[0007] Furthermore, the urethane foaming object acquired by foaming after pouring in urethane resin liquid into a mold may be used as a soundproof base material 6.

[0008]

[Problem(s) to be Solved by the Invention] Thus, although thickness of a base material 6 is made heavy-gage or he is trying to set up many metsuke amount in the soundproof base material 6 of the insulator dash 1 mentioned above in order to raise absorption-of-sound nature, when metsuke amount was increased, it led to the cost rise of a product, and since it becomes a low consistency when product thickness is made heavy-gage, while it has been fixed, dust tended to generate metsuke amount, and there was fault of causing aggravation of work environment. Moreover, the moldability also got worse and there was a trouble of becoming easy to split in the rate part of high expansion.

[0009] Furthermore, in the soundproof base material 6 which used the conventional nonwoven fabric, if a narrow diameter fiber and the loadings of the welding nature fiber of thin fiber are increased in order to raise absorption-of-sound nature, while this will also lead to a cost rise, since these fiber does not have the function to harden a base material, the trouble that the rigidity of a base material is spoiled is pointed out.

[0010] On the other hand, when felt was used, since fiber was thick, recovered wool had the fault of causing weight-ization of absorption-of-sound performance degradation or a product. Moreover, although the cost cut could be expected when urethane foam was used, at the time of incineration, harmful nitrogen oxides were generated and there was a trouble that it was disadvantageous also in respect of recycle.

[0011] This invention was made in view of such a situation, and at a low price, cost is not concerned, but an insulator dash, a floor carpet, a hood insulator, etc. are a broadly applicable sound insulating material for cars, and its manufacture approach, and it aims [ outstanding absorption-of-sound / noise insulation engine performance can be expected, and ] at offering the sound insulating material for cars of the suitable multilayer-structure mold also for recycle.

[0012]

[Means for Solving the Problem] in order it attain the above-mentioned purpose , characterize invention of this application according to claim 1 by carry out the laminating unification of the high-density epidermis layer at the front face side of the cellulose system base material fabricate according to the configuration of a car body panel , and this cellulose system base material by be made from the absorption of sound / noise insulation component which use a cellulose system fiberized material or a grinding object as the base , and the resin binder which combine this absorption of sound / noise insulation component .

[0013] The epidermis layer with high-density invention of this application according to claim 2 is characterized by consisting of a high-density nonwoven fabric.

[0014] Invention of this application according to claim 3 is characterized by piling up a cellulose system original fabric mat and a nonwoven fabric, and carrying out coincidence press forming after hot blast heat-treatment.

[0015] As an application of this invention, it is applicable to an insulator dash, a floor carpet, a hood insulator, a dash front insulator, a roof trim, a trunk trim, etc.

[0016] Here, absorption-of-sound / noise insulation component means that that the noise insulation engine performance is expectable in the rigid list of itself with weight etc. can demonstrate both noise insulation engine performance and absorption-of-sound engine performance while the absorption-of-sound engine performance by porosity is obtained.

[0017] And the natural fiber which consists of a cellulose, playback material, and recycle material are used as the above-mentioned absorption-of-sound / noise insulation component, for example, pure pulp, a regenerated cellulose, the fiberized material obtained by \*\*\*\*(ing) or grinding used paper (an old newspaper, an old magazine, corrugated paper, etc.), or a grinding object is used.

[0018] Subsequently, resin powder, such as welding nature fiber and PE (polyethylene) resin, or reactant adhesives (for example, urethane system resin adhesives), such as the low-melt point point PET, etc. can be used for the resin binder which combines absorption-of-sound / noise insulation component as a thermoplastics type. Moreover, thermosetting resin, such as phenol resin, can be used by the thermosetting resin type.

[0019] The compounding ratio of the above-mentioned absorption-of-sound / noise insulation component and a resin binder is set up between absorption-of-sound / noise insulation component / resin binder =90:10-20:80. and the time of a feeling of software and the absorption-of-sound engine performance being required by the application -- absorption-of-sound / noise insulation component -- the time of adjusting a compounding ratio richly and rigidity and the noise insulation engine performance being required -- a resin binder -- a compounding ratio is adjusted richly, respectively.

[0020] Furthermore, it is PET, PP, PE, PA (polyamide resin), etc., and fiber length has [ the diameter of fiber ] a 10-50mm thing preferably desirable [ a high-melting synthetic fiber may be added for absorption-of-sound / noise insulation component, and ] as a high-melting synthetic fiber, at 0.2-30 deniers 2-80mm.

[0021] as an epidermis layer high-density on the other hand -- a high density synthetic-fiber nonwoven fabric and a binder -- rich high density -- quality of paper --

a nonwoven fabric, glass and the high density nonwoven fabric of a natural fiber, the thing that infiltrated resin into this or a rubber sheet, a vinyl chloride sheet, etc. can be used.

[0022] furthermore -- as the above-mentioned cellulose system base material and the adhesion means of an epidermis layer -- the binder in cellulose system base material combination -- when rich, both paste up by the binder component only by carrying out hot blast heating and steam heating, where a cellulose system original fabric mat and a nonwoven fabric are piled up. Moreover, both may be pasted up with a heat lamination method of construction.

[0023] cellulose system base material combination -- a binder -- in not being rich, it carries out adhesion immobilization of a cellulose system original fabric mat and the nonwoven fabric through adhesives separately. as these adhesives, resin powder, the blow-hole-like hot melt system adhesives of the shape of the shape of the shape of the shape of powder, a pellet type, and a chip and a fog and a mesh and \*\*, and liquefied hot melt are made into the shape of yarn, and it applies random or in the shape of a mesh. Both may be pasted up on synthetic adhesives or the adhesives of the nature origin of a natural product, and the front face of a cellulose system original fabric mat by giving adhesiveness with water. In addition, film-like hot melt system adhesives can be used.

[0024] Subsequently, as an approach of unifying a cellulose system base material and an epidermis layer, when using non-permeability ingredients, such as a rubber sheet, as an epidermis layer, a cellulose system original fabric mat and an epidermis layer are heated separately, coincidence shaping is carried out, and it sticks.

[0025] Moreover, as an epidermis layer, in using permeability ingredients, such as a nonwoven fabric, it heats [ coincidence-] and fabricates [ coincidence-] and sticks a cellulose system original fabric mat and an epidermis layer, but when the ventilation resistance of an epidermis layer is high, or when the heat characteristic of a cellulose system original fabric mat is greatly different from an epidermis layer, it is necessary to heat separately, respectively.

[0026] Subsequently, that what is necessary is just to stick both with adhesives, when fabricating independently a cellulose system original fabric mat and an epidermis layer, respectively, if a cellulose system original fabric mat and an epidermis layer are unified by needle punching processing, \*\* can also fix both without adhesives.

[0027] And if natural fibers, such as a cellulose, playback material, and recycle material are adopted as main fiber according to invention according to claim 1 and the diameter of fiber uses a thin thing alternatively, while being able to raise the absorption-of-sound engine performance Since a fibrous fiberized material or a grinding object is absorption-of-sound / noise insulation component, surface area is large, absorption-of-sound / noise insulation engine performance can be raised, moreover, \*\*\*\*\* with a resin binder is strengthened and rigidity and reinforcement can also be made to raise.

[0028] Furthermore, an environmental cure top is also desirable, and as an absorption-of-sound / noise insulation component, if the fiberized material of useless articles, such as used paper, or a grinding object is used, it is advantageous [ it is also possible to incinerate and reproduce edge material and the product after use, and ]

also in cost.

[0029] Moreover, in case it is used as a base material of the interior parts which have soundproofing, the sound insulating material suitable for an application is obtained by carrying out adjustable [ of the compounding ratio of the absorption-of-sound / noise insulation component and the resin binder which used the cellulose system fiberized material or the grinding object as the base ] suitably according to absorption-of-sound / noise insulation engine performance required of a base material, or choosing the diameter of fiber of a cellulose system fiberized material, or the diameter of grinding of a grinding object.

[0030] Furthermore, since it is the configuration of carrying out the laminating of the high-density epidermis layer to the front-face side of a cellulose system base material, it is not necessary to change combination of a cellulose system base material, eyes, etc., and improvement in the rigidity by the high-density epidermis layer or the noise insulation engine performance can be expected.

[0031] Subsequently, the epidermis layer with high-density invention of this application according to claim 4 is characterized by consisting of a film.

[0032] In case invention of this application according to claim 5 laminates and carries out coincidence press forming of a cellulose system original fabric mat and the film, it is characterized by sticking an original fabric mat and a film by pressure by carrying out vacuum suction from the die by the side of a cellulose system original fabric mat.

[0033] It is characterized by securing the thickness of a Plastic solid by carrying out vacuum suction from the die by the side of a film while it supplies a compressed air from the die by the side of a cellulose system original fabric mat and carries out forced cooling of the cellulose system original fabric mat, in case invention of this application according to claim 6 laminates and carries out coincidence press forming of a cellulose system original fabric mat and the film.

[0034] Although the film or hot melt film more than 20-micrometer thickness is used, in order to prevent as a film that a film carries out melting fall during heating here, it is desirable on a film to carry out lamination processing of the nonwoven fabric of two or more 10 g/m eyes.

[0035] Furthermore, in order to make the adhesive property of a cellulose system original fabric mat and a film strengthen, that what is necessary is just to carry out adhesion immobilization through a hot melt layer among both, it may change to a hot melt layer and you may process with water, adhesives, etc.

[0036] Moreover, after considering as the approach of carrying out coincidence heating of both as a lamination method of construction of a cellulose system original fabric mat and a film, tacking carrying out of a cellulose system original fabric mat and the film by a lamination or the tacker, or the tag pin, laminating both or carrying out coincidence heating of the ingredient with an infrared heating furnace or a thermostat, it is good to fabricate.

[0037] In addition, what is necessary is to heat a cellulose system original fabric mat with hot blast heating, to heat a film with infrared heating or a thermostat, to pile up, and just to carry out shaping cooling, in heating a cellulose system original fabric mat and a film separately.

[0038] And without according to invention according to claim 4, changing combination

and the eyes of a cellulose system base material, since the film of non-permeability is stuck on the front-face side of a cellulose system base material, the noise insulation engine performance which a film has can be raised, and scattering to the exterior of a dust component can be prevented.

[0039] And according to invention according to claim 5, in addition to press \*\*, a cellulose system original fabric mat and a film are drawn by the film to an original fabric mat side with the vacuum suction force from shaping female mold, and both paste them up firmly.

[0040] And since a film follows a shaping punch mold face with the vacuum suction force from a shaping punch while being able to speed up cooling of an original fabric mat by spraying air and the air for cooling of ordinary temperature in a cellulose system original fabric mat according to invention according to claim 6, product thickness is securable.

[0041] subsequently, invention of this application according to claim 7 be characterize by prepare the high-density surface treatment layer in the front face side of the cellulose system base material fabricated according to the configuration of a car body panel by be made from absorption of sound / noise insulation component which used the cellulose system fiberized material or the grinding object as the base, and the resin binder which combine this absorption of sound / noise insulation component.

[0042] Furthermore, invention of this application according to claim 8 is characterized by controlling the noise insulation engine performance of a cellulose system base material by infiltrating a finishing agent into the front-face side of a cellulose system original fabric mat, and adjusting the amount of sinking in.

[0043] Here, when the high-density surface treatment layer formed in a cellulose system base material front face makes a mat front face become wet and makes it dry finishing agents, such as water, a water solution, and adhesives, after that by spraying processing or ripping processing at the time of a cellulose system original fabric mat, a papier-mache-like high density layer is formed.

[0044] Moreover, the processing agent on the front face of a mat can promote concordance and densification well with a cellulose component by rubbing a mat front face with the roll which is rotating at the rate with which a conveyance roll and passing speed do not synchronize.

[0045] As a finishing agent, although water, a water solution, and adhesives can be used, as adhesives, there are the following as synthetic adhesives or the adhesives of the nature origin of a natural product, and polysaccharide.

[0046] <Synthetic adhesives>, various organic systems or aquosity adhesives and an emulsion, and emulsion system adhesives [0047] <Adhesives, polysaccharide> (seaweed extract), etc. of the nature origin of a natural product

An example agar, the example alginic acid of a carrageenan, sodium alginate, and an alginic-acid compound (plant extract)

Example starch, an amylopectin, pectin, example locust bean gum of gum arabic, Cyamopsis Gum (animal albumin)

Example gelatin, casein (cellulose system)

What was chemically embellished in the cellulose besides the example methyl cellulose of an example carboxymethyl cellulose (in addition to this)

- Tackifier (adhesion grant material resin)

- A rosin (turpentine) compound and an amylose, a pectic acid, a xylan, an alginate fiber, protein system fiber [0048] and finishing agents which sink into the surface part of a cellulose system base material according to invention according to claim 7, such as resin and adhesives, -- a binder -- it is in a rich condition, a single cellulose system original fabric mat is used, and since the base material which consists of two layers from which absorption-of-sound / noise insulation engine performance differs can be fabricated, the sound insulating material according to an application can be especially offered by distribution of a low consistency layer and a high density layer.

[0049] Moreover, according to invention according to claim 8, the thickness of the high density layer in a cellulose system base material is controllable by adjusting the amount of sinking in of the processing agent infiltrated into the front-face side of a cellulose system original fabric mat.

[0050] next , invention of this application according to claim 9 be characterize by insert the high density layer which consist of a recycle material in the interior of the cellulose system base material fabricated according to the configuration of a car body panel , and this cellulose system base material by be made from absorption of sound / noise insulation component which used the cellulose system fiberized material or the grinding object as the base , and the resin binder which combine this absorption of sound / noise insulation component .

[0051] Furthermore, after invention of this application according to claim 10 deposits the charge of an admixture which mixed absorption-of-sound / noise insulation component and the resin binder in the shape of a mat, it sprinkles the grinding object of recycle material, sprinkles the above-mentioned charge of an admixture after that, is made to deposit it continuously or gradually, produces the original fabric mat of two or more layers, and is characterized by carrying out press forming after heating softening processing.

[0052] Moreover, invention of this application according to claim 11 is characterized by preparing the high-density epidermis layer or the high-density surface treatment layer in the front-face side of the cellulose system base material which comes to insert in the interior the high density layer which consists of recycle material.

[0053] Here, domestic wastes, such as synthetic-resin mold goods, may be used, without being limited to sheathing materials made of resin, such as industrial waste, such as edge material produced in an interior material production process, interior material after use, and a bumper, and automobile-related scrap wood as recycle material.

[0054] And you may become powdered although recycle material is ground and used for a fixed form or an indeterminate form, and grinding size has the good range of 1-20mm average.

[0055] Furthermore, in order for the high density layer which consists of recycle material to make the interior of a cellulose system base material paste firmly, resin powder, and hot melt and a binder may be added to recycle material.

[0056] and as an approach of inserting in the interior of a cellulose system base material the high density layer which consists of recycle material After changing the high density layer of recycle material the shape of sandwiches into a multilayer



condition on two cellulose system original fabric mats, press forming is carried out after heating softening processing. May fabricate a multilayer laminate-molding object and the layer of recycle material is inserted at the time of mat deposition at the time of cellulose system original fabric mat production. After considering as the double layer mat of one sheet, cold press molding of the heating softening processing may be performed and carried out. Furthermore, recycle material may be sprinkled on the whole surface on a cellulose system original fabric mat, it is made to pile up further each other's one more cellulose system original fabric mat after that, and cold press molding of the thing of 3 layer structure may be carried out after heating softening processing, and a multilayer layered product may be fabricated.

[0057] Moreover, as a location of a recycle layer, although the middle of a cellulose system base material is sufficient, it is made to incline toward an either, car-body, and front-face side, and you may insert.

[0058] And since a good noise insulation function is obtained without changing combination and the eyes of a cellulose system original fabric mat since a noise insulation function increases by the high density layer which consists of this recycle material since the high density layer which consists of recycle material is inserted into the cellulose system base material according to invention according to claim 9, the outstanding sound isolation engine performance is obtained.

[0059] Furthermore, according to invention according to claim 10, since it says that each ingredient of the charge of an admixture of absorption-of-sound / noise insulation component and a resin binder and the grinding object of recycle material is deposited by spraying, and the original fabric mat of two or more layers is produced, the thickness and the insertion location of a cellulose system base material and a high density layer can be adjusted suitably, and suitable absorption-of-sound / noise insulation engine performance is obtained.

[0060] And a good noise insulation function is obtained, without according to invention according to claim 11, obtaining the Mie wall noise insulation function by three persons of a car-body panel, a high density layer, and the high density layer of a cellulose system base material front face, and changing the combination in a cellulose system base material, and metsuke amount.

[0061]

[Embodiment of the Invention] Hereafter, the operation gestalt of the manufacture approach is explained to the sound insulating material list for cars concerning this invention at a detail, referring to an accompanying drawing.

[0062] The sectional view in which drawing 1 thru/or drawing 5 show the 1st operation gestalt of this invention, and showing the configuration of the insulator dash for automobiles which applied the sound insulating material for cars which drawing 1 requires for this invention, the process chart Fig. in which drawing 2 shows the manufacture approach of the insulator dash for the said automobiles, and drawing 3 are each chart Fig. showing the modification of the lamination process of a nonwoven fabric and an original-fabric mat. [ in / in the process explanatory view of the manufacture approach of the insulator dash for the said automobiles, drawing 4 , and drawing 5 / the insulator dash for the said automobiles ]

[0063] Subsequently, the sectional view in which drawing 6 thru/or drawing 10

showing the 2nd operation gestalt of this invention, and showing the configuration of the insulator dash for automobiles which applied the sound insulating material for cars which drawing 6 requires for this invention, The explanatory view in which drawing 7 shows the lamination condition of a cellulose system original fabric mat and a film, Drawing 8 , each chart Fig. in which drawing 9 shows the modification of the lamination process of an original fabric mat and a film, the explanatory view showing the forming cycle of the insulator dash which shows drawing 10 to drawing 6 , and drawing 11 are the timing diagram Figs. showing the vacuum and compressed-air operation in this forming cycle.

[0064] Next, the sectional view in which drawing 12 and drawing 13 show the 3rd operation gestalt of this invention, and drawing 12 shows the configuration of the insulator dash for automobiles, and drawing 13 are the process explanatory views showing the forming cycle of this insulator dash. The sectional view and drawing 15 which drawing 14 and drawing 15 finally show the 4th operation gestalt of the sound insulating material for cars concerning this invention, and show the configuration which applied drawing 14 to the insulator dash for automobiles are the schematic diagram of the manufacture approach of this insulator dash.

[0065] First, the 1st operation gestalt of this invention is explained based on drawing 1 thru/or drawing 5 .

[0066] In drawing 1 , the indoor side side of the dash panel 11 which divides an engine room E and the vehicle room R is equipped with the insulator dash 10 for automobiles, and it consists of two-layer structure objects with which the laminating unification of the nonwoven fabric 21 of high density was carried out at the front-face side of the cellulose system base material 20.

[0067] The above-mentioned cellulose system base material 20 is constituted considering absorption-of-sound / noise insulation component combined with the resin binder as the base. As the above-mentioned absorption-of-sound / noise insulation component, it is a cellulose system component. Specifically Pure pulp, a regenerated cellulose, and used paper (an old newspaper, an old magazine, corrugated paper, etc.), What dried the industrial waste (it may be sludge-like or moist) of the natural material origin generated in vegetation, such as wood, and the celluloses which were embellished and processed chemically, pulp and paper industry, etc. if needed is used. It is fibrous or powdered by \*\*\*\*(ing) or grinding these.

[0068] on the other hand as a resin binder , the resin powder and the reactant adhesives ( for example , urethane system adhesives ) which consist of a low-melt point point PET , such as thermal melting arrival nature fiber and polyethylene resin , can be use , and thermal melting arrival nature fiber made from the low-melt point point PET be use for the grinding object which carried out \*\*\*\* processing of the used paper as a resin binder in this operation gestalt .

[0069] And the compounding ratio of absorption-of-sound / noise insulation component and a resin binder Although what is necessary is just to set up within the limits of 90:10-20:80, Absorption-of-sound / noise insulation component / resin binder = about a setup of this compounding ratio the application as which for example, the absorption-of-sound engine performance and a feeling of software are required -- absorption-of-sound / noise insulation component -- the application as which it

considers as rich combination and rigidity and the noise insulation engine performance are required -- a resin binder -- the use range of the cellulose system base material 20 can be sharply extended by choosing a rich compounding ratio suitably.

[0070] As a cellulose system base material 20 by which a laminating is carried out to insulator 12 rear face of the above-mentioned insulator dash 10, average thickness is set as 1,000 g/m<sup>2</sup> and 20mm by the surface density list of the cellulose system base material 20, respectively by absorption-of-sound / noise insulation component / resin binder =80:20.

[0071] therefore -- since this cellulose system base material 20 is a configuration which adopts natural materials, such as a cellulose, playback material, and recycle material as the base, if the diameter of fiber and a grinding object use a narrow diameter thing -- the absorption-of-sound engine performance -- it can raise -- moreover, edge material and the product after use -- the incineration possibility of -- if it can do that it is refreshable and \*\*\*\*\* or the grinding article of useless articles, such as used paper, is use especially, it is very advantageous also in cost.

[0072] Moreover, since unlike the shape of a string acquired by shredder etc. absorption-of-sound / noise insulation engine performance is high since surface area is large, and \*\*\*\*\* with a resin binder becomes strong, the reinforcement of a product can also be raised.

[0073] Furthermore, in order to raise especially the absorption-of-sound engine performance of absorption-of-sound / noise insulation component, it is also possible to add high-melting fiber and it can choose from synthetic fibers, such as high-melting [ PET, PP, PE, and PA (polyamide resin) ], suitably as high-melting fiber in that case, and the diameter of fiber can raise the absorption-of-sound engine performance, if 0.2-30 deniers and fiber length add a 2-80mm (preferably 10-64mm) high-melting synthetic fiber.

[0074] the nonwoven fabric 21 by which a laminating is carried out to the front face of the cellulose system base material 20 on the other hand -- high density synthetic-fiber nonwoven fabrics, such as PET, PP, PE, and PA (polyamide resin), and a binder -- rich high density -- quality of paper -- a nonwoven fabric, glass and the nonwoven fabric of a natural fiber, the thing that infiltrated resin into this can be used.

[0075] And this nonwoven fabric 21 needs to be high-density in order to make insulation and rigidity strengthen, and 50 - 300 g/m<sup>2</sup> is suitable as surface density.

[0076] Therefore, a dust component does not disperse in the vehicle interior of a room from the cellulose system base material 20 with this nonwoven fabric 21, and its environmental sanitation top of the vehicle interior of a room is also desirable while the insulator dash 10 for automobiles shown in drawing 1 can avoid a cost rise since insulation and rigidity are strengthened with the high-density nonwoven fabric 21, and it does not need to set up so many the eyes or thickness of the cellulose system base material 20.

[0077] Next, the manufacture approach of the above-mentioned insulator dash 10 for automobiles is explained to a detail based on drawing 2 thru/or drawing 5 .

[0078] First, form in the shape of a mat through the process heated while compressing the charge of an admixture which mixed absorption-of-sound / noise insulation component and the resin binder to be shown in the chart Fig. of drawing 2 , and it

judges for every predetermined dimension. What is necessary is to produce the cellulose system original fabric mat M, to pile up the cellulose system original fabric mat M and a nonwoven fabric 21, and just to carry out coincidence press forming after heating softening processing, when there are many compounding ratios of the resin binder in this cellulose system original fabric mat M.

[0079] Namely, if this process is concretely explained based on drawing 3, absorption-of-sound / noise insulation component and a resin binder will be thrown in in a mixer 30. After carrying out mixed actuation, the charge 32 of an admixture is sprinkled on a band conveyor 31, hot blast is sprayed, applying press \*\* to the charge 32 of an admixture with the belt 34 in which a circulation drive is carried out by pulley 34a within a heating furnace 33, a resin binder fuses, and absorption-of-sound / noise insulation components are combined. And a given thickness Mino mat is produced, it is judged a predetermined dimension every with the cut cutting edge 35, and the cellulose system original fabric mat M is produced.

[0080] And if a nonwoven fabric 21 and the cellulose system original fabric mat M are piled up, it sets in the hot blast heating furnace 36 and hot blast is sprayed, a nonwoven fabric 21 will paste the cellulose system original fabric mat M according to a welding operation of the resin binder at this time, and the insulator dash 10 of the configuration shown in drawing 1 will be fabricated by eye a mold clamp of the cold press molding dice 37 and 38. In addition, if a nonwoven fabric 21 is arranged to the discharge side of hot blast within the hot blast heating furnace 36 at this time, a dust component will not scatter in the hot blast heating furnace 36.

[0081] Therefore, if the conventional shaping facility is used, the permeability of a nonwoven fabric 21 is used, it can really fabricate and a binder operation of the resin binder in the cellulose system original fabric mat M is used especially, it is not necessary to heat a nonwoven fabric 21 separately, and the insulator dash 10 shown in drawing 1 can be fabricated easily.

[0082] In addition, as shown in drawing 2 and drawing 3, coincidence press forming of both may be unified and carried out by the heat lamination method of construction besides pasting both up of a binder component with hot blast heating.

[0083] Moreover, what is necessary is just to take a certain adhesion means, when there are few compounding ratios of the resin binder in the cellulose system original fabric mat M. as this adhesion means, resin powder and the blow-hole-like hot melt system adhesives of the shape of the shape of the shape of the shape of powder, a pellet type, and a chip and a fog and a mesh and \*\* may be sprinkled or set, and both may be pasted up, for example, or liquefied hot melt may be made into the shape of yarn, and you may apply to the shape of random or a mesh in an adhesion side and the becoming field. Moreover, both may be pasted up with synthetic adhesives or the adhesives of the nature origin of a natural product.

[0084] Furthermore, the cellulose component in the cellulose system original fabric mat M has a hydrophilic group, and water etc. may be sprayed on a mat M surface part using the property which adhesiveness produces, or both may be pasted up by film-like hot melt.

[0085] Moreover, it may stick with the hot melt which fabricated separately the cellulose system original fabric mat M and epidermis, and was mentioned above as

shown in drawing 5 that what is necessary is to heat separately the cellulose system original fabric mat M and epidermis, and just to carry out coincidence shaping as it shows in drawing 4 , in using epidermis, such as a rubber sheet of non-permeability, in addition to nonwoven fabric which has permeability by reference 21, or adhesives. [0086] Subsequently, based on drawing 6 thru/or drawing 10 , the 2nd operation gestalt of the manufacture approach is explained to the sound insulating material list for cars concerning this invention.

[0087] Also in this 2nd operation gestalt, it is what was applied to the insulator dash 10 for automobiles, and as shown in drawing 6 , the insulator dash 10 for automobiles with which the interior-of-a-room side of a dash panel 11 is equipped consists of two-layer structure objects with which the film 22 was united with the front-face side of the cellulose system base material 20 and the cellulose system base material 20.

[0088] Since it is the same as that of the 1st operation gestalt about a configuration and its operation of the above-mentioned cellulose system base material 20, it omits here. And a film or a hot melt film 20 micrometers or more is used for the film 22 united with the front-face side of this cellulose system base material 20.

[0089] Therefore, also in the insulator dash 10 shown in drawing 6 , without changing the combination and metsuke amount in the cellulose system base material 20, since the film 22 which is rich in insulation at the front-face side of the cellulose system base material 20 is unified, a cost rise is avoided and the good noise insulation engine performance and the absorption-of-sound engine performance can be expected.

[0090] Moreover, like the high-density nonwoven fabric 21, a dust component can disperse in a heating furnace 36 in a forming cycle with a film 22, or it does not disperse in the vehicle interior of a room, and work environment and the environmental sanitation of the vehicle interior of a room can be kept good.

[0091] Subsequently, as shown in drawing 7 , at the time of heating softening, as for the film 22 really stuck on the front-face side of the cellulose system base material 20, it is desirable to unite a nonwoven fabric 23 with a front-face side so that a film 22 comes loose and may not fall, and its two or more 10 g/m surface density is required for this nonwoven fabric 23.

[0092] Moreover, in order to strengthen the adhesive property of the cellulose system base material 20 and a film 22, it is good for the M pairs of cellulose system original fabric mat opposite side of a film 22-to laminate hot melt 24, and this hot melt 24 may be formed in a base material 20 side. In addition, the front-face side of the cellulose system original fabric mat M is processed in adhesives, a water solution, etc., and you may make it heighten adhesive strength with a film 22.

[0093] Next, the unification process of the cellulose system base material 20 and a film 22 As shown in drawing 8 , the cellulose system original fabric mat M and a film 22 are laminated. Or after tacking carrying out, it may heat and the cellulose system base material 20 and film 22 which are shown in drawing 6 by press working of sheet metal may be unified. In this case, coincidence heating is [ that what is necessary is just to tacking carry out of the cellulose system original fabric mat M and the film 22 by a lamination or the tacker, or the tag pin ] possible for a heating process at an infrared heating furnace or a thermostat.

[0094] As shown in drawing 9 , while similarly carrying out hot blast heating of the

cellulose system original fabric mat M, a film 22 can be heated with an infrared heating furnace or a thermostat, and both can be doubled, it can fabricate and cool, and the insulator dash 10 shown in drawing 6 can also be fabricated.

[0095] Moreover, paying attention to using the film 22 of non-permeability, as shown in drawing 10 , a molding cycle can also be shortened using the vertical mold for shaping (it considers as a punch 40 and female mold 41) which attached the vacuum and the compressed-air device.

[0096] That is, in order for a vacuum and the compressed-air combination holes 40a and 41a to be established by the vertical molds 40 and 41, respectively and to raise the adhesive property of the cellulose system base material 20 and a film 22 to them, vacuum suction is carried out from the vacuum and compressed-air combination hole 41a of female mold 41, and the energization force is made for a film 22 to act on the cellulose system base material 20 side. Moreover, in order to secure the thickness of a product enough, vacuum suction can be carried out through the vacuum and compressed-air combination hole 40a of a punch 40, the thickness equivalent to the path clearance of the vertical molds 40 and 41 can be secured, and product board thickness can be secured faithfully.

[0097] Moreover, in order to shorten shaping (cooling) time amount, cooling water always maintains the vertical molds 40 and 41 at low temperature, or the air for cooling (a room temperature or low temperature) is blown into the cellulose system base material 20 interior through the vacuum and compressed-air combination hole 41a of female mold 41, the cellulose system base material 20 is quenched, and you may make it raise a molding cycle.

[0098] Besides, as shown in drawing 11 , the timing diagram of the vacuum suction device by female mold 40 and 41, and a compressed-air device After making a vacuum suction force act on female mold 41 and heightening the adhesive strength of the cellulose system base material 20 and a film 22 first the mold clamp back of the vertical molds 40 and 41, the air for cooling is supplied into a base material 20 from the vacuum and compressed-air combination hole 41a of female mold 41. While shortening a cooling cycle, vacuum suction is carried out from the vacuum and compressed-air combination hole 40a of the shaping punch 40, and product board thickness is secured to coincidence. Furthermore, in order to raise the unmolding nature of a product, a compressed air is made to act from the vacuum and compressed-air combination hole 40a of the shaping punch 40, and you may make it raise-unmolding nature.

[0099] Next, as drawing 12 and drawing 13 show the 3rd operation gestalt of this invention and show it to drawing 12 , it is the description that the cellulose system base material 20 in the insulator dash 10 for automobiles in this operation gestalt is formed in the two-layer structure of low consistency layer 20a which is excellent in the absorption-of-sound engine performance, and high density layer 20b which is excellent in the noise insulation engine performance.

[0100] And although the ingredient configuration of the cellulose system base material 20 is the same as that of the operation gestalt mentioned above and especially the description part of the cellulose system base material 20 is efficiently employed in low consistency layer 20a, about this high density layer 20b, it is formed in the following procedures.

[0101] That is, as shown in drawing 13 , the finishing agents 51, such as water, a water solution, and adhesives, are sprayed or applied to the whole surface of the cellulose system original fabric mat M with a sprayer 50, the above-mentioned finishing agent 51 is familiarized with the surface



part of the original fabric mat M with the conveyance roll 52, after that, it is made to dry at a desiccation process and papier-mache-like high density layer 20b is formed.

[0102] In addition, although the conveyance roll 52 moves the original fabric mat M to the next desiccation process, it heightens the frictional force of the conveyance roll 52a and the original fabric mat M front face which rotate at the rate which does not synchronize with the passing speed of the original fabric mat M, or carry out inverse rotation, and familiarizes a finishing agent 51 well, and you may make it promote densification.

[0103] The following are mentioned as adhesives of the above-mentioned finishing agent 51.

[0104] <Synthetic adhesives>, various organic systems or aqueous adhesives and an emulsion, and emulsion system adhesives [0105] <Adhesives, polysaccharide> (seaweed extract), etc. of the nature origin of a natural product

An example agar, the example alginic acid of a carrageenan, sodium alginate, and an alginic-acid compound (plant extract)

Example starch, an amylopectin, pectin, example locust bean gum of gum arabic, Cyamopsis Gum (animal albumin)

Example gelatin, casein (cellulose system)

What was chemically embellished in the cellulose besides the example methyl cellulose of an example carboxymethyl cellulose (in addition to this)

- Tackifier (adhesion grant material resin)

- A rosin (turpentine) compound and an amylose, a pectic acid, a xylan, an alginate fiber, protein system fiber [0106] Therefore, it sets on the insulator dash 10 in this 3rd operation gestalt. The cellulose system base material 20 consists of low consistency layer 20a and high density layer 20b. Since it can prevent that the good absorption-of-sound engine performance and the noise insulation engine performance good at high density layer 20b are obtained by low consistency layer 20a, and a dust component disperses outside by high density layer 20b, without changing metsuke amount, thickness, etc. of the cellulose system original fabric mat M it is thin for a material, an environment top is also desirable. Moreover, the balance of the absorption-of-sound engine performance and the noise insulation engine performance can be appropriately adjusted by adjusting the amount of sinking in of the processing agent 51 suitably.

[0107] Next, the insulator dash 10 for automobiles with which the indoor side side of a dash panel 11 is equipped as drawing 14 and drawing 15 show the 4th operation gestalt of this invention and show it to drawing 14 In addition to the bilayer layered product by which the nonwoven fabric 21 of high density was united with the configuration [ of the 1st operation gestalt ], i.e., front face of cellulose system base material 20, side, the high density layer 25 made from recycle material as an interlayer is formed in the interior of the cellulose system base material 20.

[0108] As recycle material used as the material of this high density layer 25, domestic wastes, such as grinding objects, such as industrial waste, such as edge material produced in an interior material production process, interior material after use, and a sheathing material, and not only automobile-related scrap wood but synthetic-resin mold goods, may be used. However, since a low consistency article like cloth does not have the effectiveness of the improvement in the engine performance, it is not suitable.

[0109] Moreover, recycle material is ground and used for a fixed form or an indeterminate form, and it is satisfactory even if powder-like recycle material mixes grinding size on the capacity of crushing equipment, although the range of 1-20mm is suitable.

[0110] Furthermore, in order to strengthen an adhesive property with the high density layer 25

which consists of a grinding object of the cellulose system base material 20 and recycle material, resin powder, hot melt (the shape of the shape of powder, a pellet type, and a chip), and the finishing agent 51 mentioned above may be added to recycle material.

[0111] Subsequently, as an approach of inserting the high density layer 25 in the pars intermedia of the cellulose system base material 20, as shown in drawing 15 (a), between the cellulose system original fabric mats M of two sheets, the high density layer 25 made from recycle material may be put, and cold press molding may be carried out after heating softening processing. From a container 60, this high density layer 25 sprinkles the grinding object 61 of recycle material, and is formed.

[0112] Moreover, as shown in drawing 15 (b), after depositing the charge 32 of an admixture which mixed absorption-of-sound / noise insulation component and the resin binder from the mixer 30 on a band conveyor 31 in the production process of the original fabric mat M, Sprinkle the grinding object 61 which ground recycle material from the container 60, and sprinkle the charge 32 of an admixture through a mixer 30 after that from the bottom, these are made to deposit continuously or gradually, and it is good also as a double layer mat of one sheet.

[0113] Furthermore, the cellulose system original fabric mat M may be set in a making machine just before a press, recycle material may be sprinkled, and press forming of the cellulose system original fabric mat M of one more sheet may be carried out further in piles. In addition, the high density layer 25 is biased toward an either side, and may be prepared even in the mid-position of the cellulose system base material 20.

[0114] And if the high density layer 25 is arranged to the cellulose system base material 20 interior in this way, the Mie wall noise insulation function by the dash panel 11, the high density layer 25, and three persons of the nonwoven fabric 21 of high density is obtained, and a good noise insulation function will be obtained, for example, without changing combination and the eyes of the cellulose system base material 20.

[0115] And by changing the metsuke amount of the high density layer 25 etc. suitably, adjustable [ of the noise insulation engine performance ] can be carried out, and this can also choose fine absorption-of-sound / noise insulation engine performance.

[0116] moreover, the configuration which abolished the nonwoven fabric 21 -- \*\*\*\*\* -- a nonwoven fabric 21 -- changing -- a film 22 -- or the configuration in which high density layer 20b was formed on the front face may be adopted.

[0117]

[Effect of the Invention]-The sound insulating material for cars-concerning this invention as explained above By using the cellulose system base material which used as the base absorption-of-sound / noise insulation component which used the cellulose system fiberized material or the grinding object as the base, and the resin binder which combines this absorption-of-sound / noise insulation component It adds to the operation effectiveness that it is cheap and suitable also for high performance and an environmental cure. By carrying out the laminating unification of a high-density nonwoven fabric or the film at the front-face side of this cellulose system base material, or forming a high-density surface treatment layer in the front-face side of a cellulose system base material It has the effectiveness that the noise insulation engine performance can be raised where the cheap and good absorption-of-sound engine performance is maintained, without [ without it makes the grade of a cellulose system base material raise, and ] increasing eyes and board thickness.

[0118] Furthermore, if a vacuum suction force and an air pressure force are used together in case

coincidence heating and a coincidence press will be attained, and it can fabricate at a low price and the laminating of the film will be carried out to the front face of a cellulose system base material, if the adhesive property of the resin binder of a cellulose system original fabric mat is used in case the high density nonwoven fabric which has permeability is united with a cellulose system base material, it has the operation effectiveness of being able to manufacture the sound insulating material for cars with the good moldability which has firm adhesive strength and can reproduce product board thickness faithfully.

[0119] And according to the approach of infiltrating a finishing agent and forming a high density layer in the front-face side of a cellulose system base material, by choosing a processing agent suitably and adjusting the amount of sinking in, the noise insulation engine performance to need can be controlled and it has the effectiveness of being advantageous to the fine cure against sound isolation.

[0120] Moreover, if a high density layer is set up in a cellulose system base material, a multiple wall noise insulation function is obtained and it has the effectiveness that the sound insulating material for cars which raised the noise insulation function by leaps and bounds can be offered.

#### TECHNICAL FIELD

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[Field of the Invention] This invention relates to the suitable sound insulating material for cars for an insulator dash, a floor carpet, etc. with which a dash panel and a floor panel are equipped, and its manufacture approach, especially, it is cheap, and is excellent in the absorption-of-sound engine performance, and relates to the sound insulating material for cars which consists of a multilayer-structure object which used as the base the cellulose system base material which moreover fitted recycle.

#### PRIOR ART

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[Description of the Prior Art] Usually, in order to secure the silence at the time of transit, various sound insulating materials are installed in the car. For example, as shown in drawing 16, while the interior-of-a-room side of dash panel 1a which divides an engine room E and the vehicle room R is equipped with the insulator dash 1, the floor carpet 2 is laid by the indoor side of floor panel 2a in the vehicle room R.

[0003] Moreover, while the hood insulator 4 grade attached in the interior-of-a-room side of the dash front insulator 3 attached in the interior-of-a-room side of dash panel 1a or hood panel 4a is installed in an engine room E and aiming at the sound pressure fall in an engine room E, the indoor side of roof panel 5a is equipped with the roof trim 5. In addition, although illustration is not carried out, in the trunk room or the luggage room, the interior material which has soundproofing, such as a trunk trim, a luggage trim, and a wheel house trim, is installed.

[0004] Thus, although various sound insulating materials are installed in the vehicle room R, the engine room E or the trunk room, and the luggage room, the configuration of the insulator dash 1 with which the indoor side of dash panel 1a is equipped is explained based on drawing 17 as the typical thing. The thing of the two-layer structure which united the insulator 7 with the front-face side of the soundproof base material 6 which has absorption-of-sound / noise insulation engine performance as this insulator dash 1 is known from the former.

[0005] And as for the insulator 7, the sheet material of weight, such as a playback

rubber sheet, a playback vinyl chloride sheet, etc. of high density, with which it increases is used. On the other hand as a material of the soundproof base material 6, polyester fiber, such as polyethylene terephthalate (henceforth PET), and other synthetic fibers are used as the base. Resin binders, such as thermal melting arrival nature fiber of a low-melt point point and thermoplastics powder, are added. Applying needling processing and hot blast, by performing press working of sheet metal, a nonwoven fabric mat is produced and the soundproof base material 6 is fabricated according to the configuration of dash panel 1a by carrying out cold press molding of this nonwoven fabric mat after heating softening processing.

[0006] moreover , since the felt which made the main fiber a recovered wool ( wool and the playback hair which unraveled and collected the tangles of the rug of a product and waste which use hair as a raw material ) , added the binder to this , and gave the moldability as another conventional example use , this felt be fabricate the soundproof base material 6 by carry out cold press molding to a necessary configuration after heating softening processing similarly .

[0007] Furthermore, the urethane foaming object acquired by foaming after pouring in urethane resin liquid into a mold may be used as a soundproof base material 6.

## EFFECT OF THE INVENTION

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[Effect of the Invention] The sound insulating material for cars concerning this invention as explained above By using the cellulose system base material which used as the base absorption-of-sound / noise insulation component which used the cellulose system fiberized material or the grinding object as the base, and the resin binder which combines this absorption-of-sound / noise insulation component It adds to the operation effectiveness that it is cheap and suitable also for high performance and an environmental cure. By carrying out the laminating unification of a high-density nonwoven fabric or the film at the front-face side of this cellulose system base material, or forming a high-density surface treatment layer in the front-face side of a cellulose system base material It has the effectiveness that the noise insulation engine performance can be raised where the cheap and good absorption-of-sound engine performance is maintained, without [ without it makes the grade of a cellulose system base material raise, and ] increasing eyes and board thickness.

[0118] Furthermore, if a vacuum suction force and an air pressure force are used together in case coincidence heating and a coincidence press will be attained, and it can fabricate at a low price and the laminating of the film will be carried out to the front face of a cellulose system base material, if the adhesive property of the resin binder of a cellulose system original fabric mat is used in case the high density nonwoven fabric which has permeability is united with a cellulose system base material, it has the operation effectiveness of being able to manufacture the sound insulating material for cars with the good moldability which has firm adhesive strength and can reproduce product board thickness faithfully.

[0119] And according to the approach of infiltrating a finishing agent and forming a high density layer in the front-face side of a cellulose system base material, by choosing a processing agent suitably and adjusting the amount of sinking in, the noise

insulation engine performance to need can be controlled and it has the effectiveness of being advantageous to the fine cure against sound isolation.

[0120] Moreover, if a high density layer is set up in a cellulose system base material, a multiple wall noise insulation function is obtained and it has the effectiveness that the sound insulating material for cars which raised the noise insulation function by leaps and bounds can be offered.

## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] Thus, although thickness of a base material 6 is made heavy-gage or he is trying to set up many metsuke amount in the soundproof base material 6 of the insulator dash 1 mentioned above in order to raise absorption-of-sound nature, when metsuke amount was increased, it led to the cost rise of a product, and since it becomes a low consistency when product thickness is made heavy-gage, while it has been fixed, dust tended to generate metsuke amount, and there was fault of causing aggravation of work environment. Moreover, the moldability also got worse and there was a trouble of becoming easy to split in the rate part of high expansion.

[0009] Furthermore, in the soundproof base material 6 which used the conventional nonwoven fabric, if a narrow diameter fiber and the loadings of the welding nature fiber of thin fiber are increased in order to raise absorption-of-sound nature, while this will also lead to a cost rise, since these fiber does not have the function to harden a base material, the trouble that the rigidity of a base material is spoiled is pointed out.

[0010] On the other hand, when felt was used, since fiber was thick, recovered wool had the fault of causing weight-ization of absorption-of-sound performance degradation or a product. Moreover, although the cost cut could be expected when urethane foam was used, at the time of incineration, harmful nitrogen oxides were generated and there was a trouble that it was disadvantageous also in respect of recycle.

[0011] This invention was made in view of such a situation, and at a low price, cost is not concerned, but an insulator dash, a floor carpet, a hood insulator, etc. are a broadly applicable sound insulating material for cars, and its manufacture approach, and it aims [ outstanding absorption-of-sound / noise insulation engine performance can be expected, and ] at offering the sound insulating material for cars of the suitable multilayer-structure mold also for recycle.

## MEANS

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[Means for Solving the Problem] in order it attain the above-mentioned purpose , characterize invention of this application according to claim 1 by carry out the laminating unification of the high-density epidermis layer at the front face side of the cellulose system base material fabricate according to the configuration of a car body panel , and this cellulose system base material by be made from the absorption of sound / noise insulation component which use a cellulose system fiberized material or a grinding object as the base , and the resin binder which combine this absorption of

sound / noise insulation component .

[0013] The epidermis layer with high-density invention of this application according to claim 2 is characterized by consisting of a high-density nonwoven fabric.

[0014] Invention of this application according to claim 3 is characterized by piling up a cellulose system original fabric mat and a nonwoven fabric, and carrying out coincidence press forming after hot blast heat-treatment.

[0015] As an application of this invention, it is applicable to an insulator dash, a floor carpet, a hood insulator, a dash front insulator, a roof trim, a trunk trim, etc.

[0016] Here, absorption-of-sound / noise insulation component means that that the noise insulation engine performance is expectable in the rigid list of itself with weight etc. can demonstrate both noise insulation engine performance and absorption-of-sound engine performance while the absorption-of-sound engine performance by porosity is obtained.

[0017] And the natural fiber which consists of a cellulose, playback material, and recycle material are used as the above-mentioned absorption-of-sound / noise insulation component, for example, pure pulp, a regenerated cellulose, the fiberized material obtained by \*\*\*\*(ing) or grinding used paper (an old newspaper, an old magazine, corrugated paper, etc.), or a grinding object is used.

[0018] Subsequently, resin powder, such as welding nature fiber and PE (polyethylene) resin, or reactant adhesives (for example, urethane system resin adhesives), such as the low-melt point point PET, etc. can be used for the resin binder which combines absorption-of-sound / noise insulation component as a thermoplastics type. Moreover, thermosetting resin, such as phenol resin, can be used by the thermosetting resin type.

[0019] The compounding ratio of the above-mentioned absorption-of-sound / noise insulation component and a resin binder is set up between absorption-of-sound / noise insulation component / resin binder =90:10-20:80. and the time of a feeling of software and the absorption-of-sound engine performance being required by the application -- absorption-of-sound / noise insulation component -- the time of adjusting a compounding ratio richly and rigidity and the noise insulation engine performance being required -- a resin binder -- a compounding ratio is adjusted richly, respectively.

[0020] Furthermore, it is PET, PP, PE, PA (polyamide resin), etc., and fiber length has [ the diameter of fiber ] a 10-50mm thing preferably desirable [ a high-melting synthetic fiber may be added for absorption-of-sound / noise insulation component, and ] as a high-melting synthetic fiber, at 0.2-30 deniers 2-80mm.

[0021] as an epidermis layer high-density on the other hand -- a high density synthetic-fiber nonwoven fabric and a binder -- rich high density -- quality of paper -- a nonwoven fabric, glass and the high density nonwoven fabric of a natural fiber, the thing that infiltrated resin into this or a rubber sheet, a vinyl chloride sheet, etc. can be used.

[0022] furthermore -- as the above-mentioned cellulose system base material and the adhesion means of an epidermis layer -- the binder in cellulose system base material combination -- when rich, both paste up by the binder component only by carrying out hot blast heating and steam heating, where a cellulose system original fabric mat and a nonwoven fabric are piled up. Moreover, both may be pasted up with a heat



lamination method of construction.

[0023] cellulose system base material combination -- a binder -- in not being rich, it carries out adhesion immobilization of a cellulose system original fabric mat and the nonwoven fabric through adhesives separately. as these adhesives, resin powder, the blow-hole-like hot melt system adhesives of the shape of the shape of the shape of the shape of powder, a pellet type, and a chip and a fog and a mesh and \*\*, and liquefied hot melt are made into the shape of yarn, and it applies random or in the shape of a mesh. Both may be pasted up on synthetic adhesives or the adhesives of the nature origin of a natural product, and the front face of a cellulose system original fabric mat by giving adhesiveness with water. In addition, film-like hot melt system adhesives can be used.

[0024] Subsequently, as an approach of unifying a cellulose system base material and an epidermis layer, when using non-permeability ingredients, such as a rubber sheet, as an epidermis layer, a cellulose system original fabric mat and an epidermis layer are heated separately, coincidence shaping is carried out, and it sticks.

[0025] Moreover, as an epidermis layer, in using permeability ingredients, such as a nonwoven fabric, it heats [ coincidence-] and fabricates [ coincidence-] and sticks a cellulose system original fabric mat and an epidermis layer, but when the ventilation resistance of an epidermis layer is high, or when the heat characteristic of a cellulose system original fabric mat is greatly different from an epidermis layer, it is necessary to heat separately, respectively.

[0026] Subsequently, that what is necessary is just to stick both with adhesives, when fabricating independently a cellulose system original fabric mat and an epidermis layer, respectively, if a cellulose system original fabric mat and an epidermis layer are unified by needle punching processing, \*\* can also fix both without adhesives.

[0027] And if natural fibers, such as a cellulose, playback material, and recycle material are adopted as main fiber according to invention according to claim 1 and the diameter of fiber uses a thin thing alternatively, while being able to raise the absorption-of-sound engine performance Since a fibrous fiberized material or a grinding object is absorption-of-sound / noise insulation component, surface area is large, absorption-of-sound / noise insulation engine performance can be raised, moreover, \*\*\*\*\* with a resin binder is strengthened and rigidity and reinforcement can also be made to raise.

[0028] Furthermore, an environmental cure top is also desirable, and as an absorption-of-sound / noise insulation component, if the fiberized material of useless articles, such as used paper, or a grinding object is used, it is advantageous [ it is also possible to incinerate and reproduce edge material and the product after use, and ] also in cost.

[0029] Moreover, in case it is used as a base material of the interior parts which have soundproofing, the sound insulating material suitable for an application is obtained by carrying out adjustable [ of the compounding ratio of the absorption-of-sound / noise insulation component and the resin binder which used the cellulose system fiberized material or the grinding object as the base ] suitably according to absorption-of-sound / noise insulation engine performance required of a base material, or choosing the diameter of fiber of a cellulose system fiberized material, or the

diameter of grinding of a grinding object.

[0030] Furthermore, since it is the configuration of carrying out the laminating of the high-density epidermis layer to the front-face side of a cellulose system base material, it is not necessary to change combination of a cellulose system base material, eyes, etc., and improvement in the rigidity by the high-density epidermis layer or the noise insulation engine performance can be expected.

[0031] Subsequently, the epidermis layer with high-density invention of this application according to claim 4 is characterized by consisting of a film.

[0032] In case invention of this application according to claim 5 laminates and carries out coincidence press forming of a cellulose system original fabric mat and the film, it is characterized by sticking an original fabric mat and a film by pressure by carrying out vacuum suction from the die by the side of a cellulose system original fabric mat.

[0033] It is characterized by securing the thickness of a Plastic solid by carrying out vacuum suction from the die by the side of a film while it supplies a compressed air from the die by the side of a cellulose system original fabric mat and carries out forced cooling of the cellulose system original fabric mat, in case invention of this application according to claim 6 laminates and carries out coincidence press forming of a cellulose system original fabric mat and the film.

[0034] Although the film or hot melt film more than 20-micrometer thickness is used, in order to prevent as a film that a film carries out melting fall during heating here, it is desirable on a film to carry out lamination processing of the nonwoven fabric of two or more 10 g/m eyes.

[0035] Furthermore, in order to make the adhesive property of a cellulose system original fabric mat and a film strengthen, that what is necessary is just to carry out adhesion immobilization through a hot melt layer among both, it may change to a hot melt layer and you may process with water, adhesives, etc.

[0036] Moreover, after considering as the approach of carrying out coincidence heating of both as a lamination method of construction of a cellulose system original fabric mat and a film, tacking carrying out of a cellulose system original fabric mat and the film by a lamination or the tacker, or the tag pin, laminating both or carrying out coincidence heating of the ingredient with an infrared heating furnace or a thermostat, it is good to fabricate.

[0037] In addition, what is necessary is to heat a cellulose system original fabric mat with hot blast heating, to heat a film with infrared heating or a thermostat, to pile up, and just to carry out shaping cooling, in heating a cellulose system original fabric mat and a film separately.

[0038] And without according to invention according to claim 4, changing combination and the eyes of a cellulose system base material, since the film of non-permeability is stuck on the front-face side of a cellulose system base material, the noise insulation engine performance which a film has can be raised, and scattering to the exterior of a dust component can be prevented.

[0039] And according to invention according to claim 5, in addition to press \*\*, a cellulose system original fabric mat and a film are drawn by the film to an original fabric mat side with the vacuum suction force from shaping female mold, and both paste them up firmly.

[0040] And since a film follows a shaping punch mold face with the vacuum suction force from a shaping punch while being able to speed up cooling of an original fabric mat by spraying air and the air for cooling of ordinary temperature in a cellulose system original fabric mat according to invention according to claim 6, product thickness is securable.

[0041] subsequently, invention of this application according to claim 7 be characterize by prepare the high-density surface treatment layer in the front face side of the cellulose system base material fabricated according to the configuration of a car body panel by be made from absorption of sound / noise insulation component which used the cellulose system fiberized material or the grinding object as the base, and the resin binder which combine this absorption of sound / noise insulation component.

[0042] Furthermore, invention of this application according to claim 8 is characterized by controlling the noise insulation engine performance of a cellulose system base material by infiltrating a finishing agent into the front-face side of a cellulose system original fabric mat, and adjusting the amount of sinking in.

[0043] Here, when the high-density surface treatment layer formed in a cellulose system base material front face makes a mat front face become wet and makes it dry finishing agents, such as water, a water solution, and adhesives, after that by spraying processing or ripping processing at the time of a cellulose system original fabric mat, a papier-mache-like high density layer is formed.

[0044] Moreover, the processing agent on the front face of a mat can promote concordance and densification well with a cellulose component by rubbing a mat front face with the roll which is rotating at the rate with which a conveyance roll and passing speed do not synchronize.

[0045] As a finishing agent, although water, a water solution, and adhesives can be used, as adhesives, there are the following as synthetic adhesives or the adhesives of the nature origin of a natural product, and polysaccharide.

[0046] <Synthetic adhesives>, various organic systems or aqueous adhesives and an emulsion, and emulsion system adhesives [0047] <Adhesives, polysaccharide> (seaweed extract), etc. of the nature origin of a natural product

An example agar, the example alginic acid of a carrageenan, sodium alginate, and an alginic-acid compound (plant extract)

Example starch, an amylopectin, pectin, example locust bean gum of gum arabic, Cyamopsis Gum (animal albumin)

Example gelatin, casein (cellulose system)

What was chemically embellished in the cellulose besides the example methyl cellulose of an example carboxymethyl cellulose (in addition to this)

- Tackifier (adhesion grant material resin)

- A rosin (turpentine) compound and an amylose, a pectic acid, a xylan, an alginate fiber, protein system fiber [0048] and finishing agents which sink into the surface part of a cellulose system base material according to invention according to claim 7, such as resin and adhesives, -- a binder -- it is in a rich condition, a single cellulose system original fabric mat is used, and since the base material which consists of two layers from which absorption-of-sound / noise insulation engine performance differs can be fabricated, the sound insulating material according to an application can be especially

offered by distribution of a low consistency layer and a high density layer.

[0049] Moreover, according to invention according to claim 8, the thickness of the high density layer in a cellulose system base material is controllable by adjusting the amount of sinking in of the processing agent infiltrated into the front-face side of a cellulose system original fabric mat.

[0050] next , invention of this application according to claim 9 be characterize by insert the high density layer which consist of a recycle material in the interior of the cellulose system base material fabricated according to the configuration of a car body panel , and this cellulose system base material by be made from absorption of sound / noise insulation component which used the cellulose system fiberized material or the grinding object as the base , and the resin binder which combine this absorption of sound / noise insulation component .

[0051] Furthermore, after invention of this application according to claim 10 deposits the charge of an admixture which mixed absorption-of-sound / noise insulation component and the resin binder in the shape of a mat, it sprinkles the grinding object of recycle material, sprinkles the above-mentioned charge of an admixture after that, is made to deposit it continuously or gradually, produces the original fabric mat of two or more layers, and is characterized by carrying out press forming after heating softening processing.

[0052] Moreover, invention of this application according to claim 11 is characterized by preparing the high-density epidermis layer or the high-density surface treatment layer in the front-face side of the cellulose system base material which comes to insert in the interior the high density layer which consists of recycle material.

[0053] Here, domestic wastes, such as synthetic-resin mold goods, may be used, without being limited to sheathing materials made of resin, such as industrial waste, such as edge material produced in an interior material production process, interior material after use, and a bumper, and automobile-related scrap wood as recycle material.

[0054] And you may become powdered although recycle material is ground and used for a fixed form or an indeterminate form, and grinding size has the good range of 1-20mm average.

[0055] Furthermore, in order for the high density layer which consists of recycle material to make the interior of a cellulose system base material paste firmly, resin powder, and hot melt and a binder may be added to recycle material.

[0056] and as an approach of inserting in the interior of a cellulose system base material the high density layer which consists of recycle material After changing the high density layer of recycle material the shape of sandwiches into a multilayer condition on two cellulose system original fabric mats, press forming is carried out after heating softening processing. May fabricate a multilayer laminate-molding object and the layer of recycle material is inserted at the time of mat deposition at the time of cellulose system original fabric mat production. After considering as the double layer mat of one sheet, cold press molding of the heating softening processing may be performed and carried out. Furthermore, recycle material may be sprinkled on the whole surface on a cellulose system original fabric mat, it is made to pile up further each other's one more cellulose system original fabric mat after that, and cold

press molding of the thing of 3 layer structure may be carried out after heating softening processing, and a multilayer layered product may be fabricated.

[0057] Moreover, as a location of a recycle layer, although the middle of a cellulose system base material is sufficient, it is made to incline toward an either, car-body, and front-face side, and you may insert.

[0058] And since a good noise insulation function is obtained without changing combination and the eyes of a cellulose system original fabric mat since a noise insulation function increases by the high density layer which consists of this recycle material since the high density layer which consists of recycle material is inserted into the cellulose system base material according to invention according to claim 9, the outstanding sound isolation engine performance is obtained.

[0059] Furthermore, according to invention according to claim 10, since it says that each ingredient of the charge of an admixture of absorption-of-sound / noise insulation component and a resin binder and the grinding object of recycle material is deposited by spraying, and the original fabric mat of two or more layers is produced, the thickness and the insertion location of a cellulose system base material and a high density layer can be adjusted suitably, and suitable absorption-of-sound / noise insulation engine performance is obtained.

[0060] And a good noise insulation function is obtained, without according to invention according to claim 11, obtaining the Mie wall noise insulation function by three persons of a car-body panel, a high density layer, and the high density layer of a cellulose system base material front face, and changing the combination in a cellulose system base material, and metsuke amount.

[0061]

[Embodiment of the Invention] Hereafter, the operation gestalt of the manufacture approach is explained to the sound insulating material list for cars concerning this invention at a detail, referring to an accompanying drawing.

[0062] The sectional view in which drawing 1 thru/or drawing 5 show the 1st operation gestalt of this invention, and showing the configuration of the insulator dash for automobiles which applied the sound insulating material for cars which drawing 1 requires for this invention, the process chart Fig. in which drawing 2 shows the manufacture approach of the insulator dash for the said automobiles, and drawing 3 are each chart Fig. showing the modification of the lamination process of a nonwoven fabric and an original-fabric mat. [ in / in the process explanatory view of the manufacture approach of the insulator dash for the said automobiles, drawing 4 , and drawing 5 / the insulator dash for the said automobiles ]

[0063] Subsequently, the sectional view in which drawing 6 thru/or drawing 10 showing the 2nd operation gestalt of this invention, and showing the configuration of the insulator dash for automobiles which applied the sound insulating material for cars which drawing 6 requires for this invention, The explanatory view in which drawing 7 shows the lamination condition of a cellulose system original fabric mat and a film, Drawing 8 , each chart Fig. in which drawing 9 shows the modification of the lamination process of an original fabric mat and a film, the explanatory view showing the forming cycle of the insulator dash which shows drawing 10 to drawing 6 , and drawing 11 are the timing diagram Figs. showing the vacuum and compressed-air operation in this forming cycle.

[0064] Next, the sectional view in which drawing 12 and drawing 13 show the 3rd operation

gestalt of this invention, and drawing 12 shows the configuration of the insulator dash for automobiles, and drawing 13 are the process explanatory views showing the forming cycle of this insulator dash. The sectional view and drawing 15 which drawing 14 and drawing 15 finally show the 4th operation gestalt of the sound insulating material for cars concerning this invention, and show the configuration which applied drawing 14 to the insulator dash for automobiles are the schematic diagram of the manufacture approach of this insulator dash.

[0065] First, the 1st operation gestalt of this invention is explained based on drawing 1 thru/or drawing 5 .

[0066] In drawing 1 , the indoor side side of the dash panel 11 which divides an engine room E and the vehicle room R is equipped with the insulator dash 10 for automobiles, and it consists of two-layer structure objects with which the laminating unification of the nonwoven fabric 21 of high density was carried out at the front-face side of the cellulose system base material 20.

[0067] The above-mentioned cellulose system base material 20 is constituted considering absorption-of-sound / noise insulation component combined with the resin binder as the base. As the above-mentioned absorption-of-sound / noise insulation component, it is a cellulose system component. Specifically Pure pulp, a regenerated cellulose, and used paper (an old newspaper, an old magazine, corrugated paper, etc.), What dried the industrial waste (it may be sludge-like or moist) of the natural material origin generated in vegetation, such as wood, and the celluloses which were embellished and processed chemically, pulp and paper industry, etc. if needed is used. It is fibrous or powdered by \*\*\*\*(ing) or grinding these.

[0068] on the other hand as a resin binder , the resin powder and the reactant adhesives ( for example , urethane system adhesives ) which consist of a low-melt point point PET , such as thermal melting arrival nature fiber and polyethylene resin , can be use , and thermal melting arrival nature fiber made from the low-melt point point PET be use for the grinding object which carried out \*\*\*\* processing of the used paper as a resin binder in this operation gestalt .

[0069] And the compounding ratio of absorption-of-sound / noise insulation component and a resin binder Although what is necessary is just to set up within the limits of 90:10-20:80, Absorption-of-sound / noise insulation component / resin binder = about a setup of this compounding ratio the application as which for example, the absorption-of-sound engine performance and a feeling of software are required -- absorption-of-sound / noise insulation component -- the application as which it considers as rich combination and rigidity and the noise insulation engine performance are required -- a resin binder -- the use range of the cellulose system base material 20 can be sharply extended by choosing a rich compounding ratio suitably.

[0070] As a cellulose system base material 20 by which a laminating is carried out to insulator 12 rear face of the above-mentioned insulator dash 10, average thickness is set as 1,000 g/m<sup>2</sup> and 20mm by the surface density list of the cellulose system base material 20, respectively by absorption-of-sound / noise insulation component / resin binder =80:20.

[0071] therefore -- since this cellulose system base material 20 is a configuration which adopts natural materials, such as a cellulose, playback material, and recycle material as the base, if the diameter of fiber and a grinding object use a narrow diameter thing -- the absorption-of-sound engine performance -- it can raise -- moreover, edge material and the product after use -- the incineration possibility of -- if it can do that it is refreshable and \*\*\*\*\* or the grinding article of useless articles, such as used paper, is use especially, it is very advantageous also in cost.

[0072] Moreover, since unlike the shape of a string acquired by shredder etc. absorption-of-sound / noise insulation engine performance is high since surface area is large, and \*\*\*\*\* with a resin

binder becomes strong, the reinforcement of a product can also be raised.

[0073] Furthermore, in order to raise especially the absorption-of-sound engine performance of absorption-of-sound / noise insulation component, it is also possible to add high-melting fiber and it can choose from synthetic fibers, such as high-melting [ PET, PP, PE, and PA (polyamide resin) ], suitably as high-melting fiber in that case, and the diameter of fiber can raise the absorption-of-sound engine performance, if 0.2-30 deniers and fiber length add a 2-80mm (preferably 10-64mm) high-melting synthetic fiber.

[0074] the nonwoven fabric 21 by which a laminating is carried out to the front face of the cellulose system base material 20 on the other hand -- high density synthetic-fiber nonwoven fabrics, such as PET, PP, PE, and PA (polyamide resin), and a binder -- rich high density -- quality of paper -- a nonwoven fabric, glass and the nonwoven fabric of a natural fiber, the thing that infiltrated resin into this can be used.

[0075] And this nonwoven fabric 21 needs to be high-density in order to make insulation and rigidity strengthen, and 50 - 300 g/m<sup>2</sup> is suitable as surface density.

[0076] Therefore, a dust component does not disperse in the vehicle interior of a room from the cellulose system base material 20 with this nonwoven fabric 21, and its environmental sanitation top of the vehicle interior of a room is also desirable while the insulator dash 10 for automobiles shown in drawing 1 can avoid a cost rise since insulation and rigidity are strengthened with the high-density nonwoven fabric 21, and it does not need to set up so many the eyes or thickness of the cellulose system base material 20.

[0077] Next, the manufacture approach of the above-mentioned insulator dash 10 for automobiles is explained to a detail based on drawing 2 thru/or drawing 5 .

[0078] First, form in the shape of a mat through the process heated while compressing the charge of an admixture which mixed absorption-of-sound / noise insulation component and the resin binder to be shown in the chart Fig. of drawing 2 , and it judges for every predetermined dimension. What is necessary is to produce the cellulose system original fabric mat M, to pile up the cellulose system original fabric mat M and a nonwoven fabric 21, and just to carry out coincidence press forming after heating softening processing, when there are many compounding ratios of the resin binder in this cellulose system original fabric mat M.

[0079] Namely, if this process is concretely explained based on drawing 3 , absorption-of-sound / noise insulation component and a resin binder will be thrown in in a mixer 30. After carrying out mixed actuation, the charge 32 of an admixture is sprinkled on a band conveyor 31, hot blast is sprayed, applying press \*\* to the charge 32 of an admixture with the belt 34 in which a circulation drive is carried out by pulley 34a within a heating furnace 33, a resin binder fuses, and absorption-of-sound / noise insulation components are combined. And a given thickness Mino mat is produced, it is judged a predetermined dimension every with the cut cutting edge 35, and the cellulose system original fabric mat M is produced.

[0080] And if a nonwoven fabric 21 and the cellulose system original fabric mat M are piled up, it sets in the hot blast heating furnace 36 and hot blast is sprayed, a nonwoven fabric 21 will paste the cellulose system original fabric mat M according to a welding operation of the resin binder at this time, and the insulator dash 10 of the configuration shown in drawing 1 will be fabricated by eye a mold clamp of the cold press molding dice 37 and 38. In addition, if a nonwoven fabric 21 is arranged to the discharge side of hot blast within the hot blast heating furnace 36 at this time, a dust component will not scatter in the hot blast heating furnace 36.

[0081] Therefore, if the conventional shaping facility is used, the permeability of a nonwoven



fabric 21 is used, it can really fabricate and a binder operation of the resin binder in the cellulose system original fabric mat M is used especially, it is not necessary to heat a nonwoven fabric 21 separately, and the insulator dash 10 shown in drawing 1 can be fabricated easily.

[0082] In addition, as shown in drawing 2 and drawing 3 , coincidence press forming of both may be unified and carried out by the heat lamination method of construction besides pasting both up of a binder component with hot blast heating.

[0083] Moreover, what is necessary is just to take a certain adhesion means, when there are few compounding ratios of the resin binder in the cellulose system original fabric mat M. as this adhesion means, resin powder and the blow-hole-like hot melt system adhesives of the shape of the shape of the shape of the shape of powder, a pellet type, and a chip and a fog and a mesh and \*\* may be sprinkled or set, and both may be pasted up, for example, or liquefied hot melt may be made into the shape of yarn, and you may apply to the shape of random or a mesh in an adhesion side and the becoming field. Moreover, both may be pasted up with synthetic adhesives or the adhesives of the nature origin of a natural product.

[0084] Furthermore, the cellulose component in the cellulose system original fabric mat M has a hydrophilic group, and water etc. may be sprayed on a mat M surface part using the property which adhesiveness produces, or both may be pasted up by film-like hot melt.

[0085] Moreover, it may stick with the hot melt which fabricated separately the cellulose system original fabric mat M and epidermis, and was mentioned above as shown in drawing 5 that what is necessary is to heat separately the cellulose system original fabric mat M and epidermis, and just to carry out coincidence shaping as it shows in drawing 4 , in using epidermis, such as a rubber sheet of non-permeability, in addition to nonwoven fabric which has permeability by reference 21, or adhesives.

[0086] Subsequently, based on drawing 6 thru/or drawing 10 , the 2nd operation gestalt of the manufacture approach is explained to the sound insulating material list for cars concerning this invention.

[0087] Also in this 2nd operation gestalt, it is what was applied to the insulator dash 10 for automobiles, and as shown in drawing 6 , the insulator dash 10 for automobiles with which the interior-of-a-room side of a dash panel 11 is equipped consists of two-layer structure objects with which the film 22 was united with the front-face side of the cellulose system base material 20 and the cellulose system base material 20.

[0088] Since it is the same as that of the 1st operation gestalt about a configuration and its operation of the above-mentioned cellulose system base material 20, it omits here. And a film or a hot melt film 20 micrometers or more is used for the film 22 united with the front-face side of this cellulose system base material 20.

[0089] Therefore, also in the insulator dash 10 shown in drawing 6 , without changing the combination and metsuke amount in the cellulose system base material 20, since the film 22 which is rich in insulation at the front-face side of the cellulose system base material 20 is unified, a cost rise is avoided and the good noise insulation engine performance and the absorption-of-sound engine performance can be expected.

[0090] Moreover, like the high-density nonwoven fabric 21, a dust component can disperse in a heating furnace 36 in a forming cycle with a film 22, or it does not disperse in the vehicle interior of a room, and work environment and the environmental sanitation of the vehicle interior of a room can be kept good.

[0091] Subsequently, as shown in drawing 7 , at the time of heating softening, as for the film 22

really stuck on the front-face side of the cellulose system base material 20, it is desirable to unite a nonwoven fabric 23 with a front-face side so that a film 22 comes loose and may not fall, and its two or more 10 g/m surface density is required for this nonwoven fabric 23.

[0092] Moreover, in order to strengthen the adhesive property of the cellulose system base material 20 and a film 22, it is good for the M pairs of cellulose system original fabric mat opposite side of a film 22 to laminate hot melt 24, and this hot melt 24 may be formed in a base material 20 side. In addition, the front-face side of the cellulose system original fabric mat M is processed in adhesives, a water solution, etc., and you may make it heighten adhesive strength with a film 22.

[0093] Next, the unification process of the cellulose system base material 20 and a film 22 As shown in drawing 8 , the cellulose system original fabric mat M and a film 22 are laminated. Or after tacking carrying out, it may heat and the cellulose system base material 20 and film 22 which are shown in drawing 6 by press working of sheet metal may be unified. In this case, coincidence heating is [ that what is necessary is just to tacking carry out of the cellulose system original fabric mat M and the film 22 by a lamination or the tacker, or the tag pin ] possible for a heating process at an infrared heating furnace or a thermostat.

[0094] As shown in drawing 9 , while similarly carrying out hot blast heating of the cellulose system original fabric mat M, a film 22 can be heated with an infrared heating furnace or a thermostat, and both can be doubled, it can fabricate and cool, and the insulator dash 10 shown in drawing 6 can also be fabricated.

[0095] Moreover, paying attention to using the film 22 of non-permeability, as shown in drawing 10 , a molding cycle can also be shortened using the vertical mold for shaping (it considers as a punch 40 and female mold 41) which attached the vacuum and the compressed-air device.

[0096] That is, in order for a vacuum and the compressed-air combination holes 40a and 41a to be established by the vertical molds 40 and 41, respectively and to raise the adhesive property of the cellulose system base material 20 and a film 22 to them, vacuum suction is carried out from the vacuum and compressed-air combination hole 41a of female mold 41, and the energization force is made for a film 22 to act on the cellulose system base material 20 side. Moreover, in order to secure the thickness of a product enough, vacuum suction can be carried out through the vacuum and compressed-air combination hole 40a of a punch 40, the thickness equivalent to the path clearance of the vertical molds 40 and 41 can be secured, and product board thickness can be secured faithfully.

[0097] Moreover, in order to shorten shaping (cooling) time amount, cooling water always maintains the vertical molds 40 and 41 at low temperature, or the air for cooling (a room temperature or low temperature) is blown into the cellulose system base material 20 interior through the vacuum and compressed-air combination hole 41a of female mold 41, the cellulose system base material 20 is quenched, and you may make it raise a molding cycle.

[0098] Besides, as shown in drawing 11 , the timing diagram of the vacuum suction device by female mold 40 and 41, and a compressed-air device After making a vacuum suction force act on female mold 41 and heightening the adhesive strength of the cellulose system base material 20 and a film 22 first the mold clamp back of the vertical molds 40 and 41, the air for cooling is supplied into a base material 20 from the vacuum and compressed-air combination hole 41a of female mold 41. While shortening a cooling cycle, vacuum suction is carried out from the vacuum and compressed-air combination hole 40a of the shaping punch 40, and product board thickness is secured to coincidence. Furthermore, in order to raise the unmolding nature of a product, a

compressed air is made to act from the vacuum and compressed-air combination hole 40a of the shaping punch 40, and you may make it raise unmolding nature.

[0099] Next, as drawing 12 and drawing 13 show the 3rd operation gestalt of this invention and show it to drawing 12, it is the description that the cellulose system base material 20 in the insulator dash 10 for automobiles in this operation gestalt is formed in the two-layer structure of low consistency layer 20a which is excellent in the absorption-of-sound engine performance, and high density layer 20b which is excellent in the noise insulation engine performance.

[0100] And although the ingredient configuration of the cellulose system base material 20 is the same as that of the operation gestalt mentioned above and especially the description part of the cellulose system base material 20 is efficiently employed in low consistency layer 20a, about this high density layer 20b, it is formed in the following procedures.

[0101] That is, as shown in drawing 13, the finishing agents 51, such as water, a water solution, and adhesives, are sprayed or applied to the whole surface of the cellulose system original fabric mat M with a sprayer 50, the above-mentioned finishing agent 51 is familiarized with the surface part of the original fabric mat M with the conveyance roll 52, after that, it is made to dry at a desiccation process and papier-mache-like high density layer 20b is formed.

[0102] In addition, although the conveyance roll 52 moves the original fabric mat M to the next desiccation process, it heightens the frictional force of the conveyance roll 52a and the original fabric mat M front face which rotate at the rate which does not synchronize with the passing speed of the original fabric mat M, or carry out inverse rotation, and familiarizes a finishing agent 51 well, and you may make it promote densification.

[0103] The following are mentioned as adhesives of the above-mentioned finishing agent 51.

[0104] <Synthetic adhesives>, various organic systems or aqueous adhesives and an emulsion, and emulsion system adhesives [0105] <Adhesives, polysaccharide> (seaweed extract), etc. of the nature origin of a natural product

An example agar, the example alginic acid of a carrageenan, sodium alginate, and an alginic-acid compound (plant extract)

Example starch, an amylopectin, pectin, example locust bean gum of gum arabic, Cyamopsis Gum (animal albumin)

Example gelatin, casein (cellulose system)

What was chemically embellished in the cellulose besides the example methyl cellulose of an example carboxymethyl cellulose (in addition to this)

- Tackifier (adhesion grant material resin)

- A rosin (turpentine) compound and an amylose, a pectic acid, a xylan, an alginate fiber, protein system fiber [0106] Therefore, it sets on the insulator dash 10 in this 3rd operation gestalt. The cellulose system base material 20 consists of low consistency layer 20a and high density layer 20b. Since it can prevent that the good absorption-of-sound engine performance and the noise insulation engine performance good at high density layer 20b are obtained by low consistency layer 20a, and a dust component disperses outside by high density layer 20b, without changing metsuke amount, thickness, etc. of the cellulose system original fabric mat M it is thin for a material, an environment top is also desirable. Moreover, the balance of the absorption-of-sound engine performance and the noise insulation engine performance can be appropriately adjusted by adjusting the amount of sinking in of the processing agent 51 suitably.

[0107] Next, the insulator dash 10 for automobiles with which the indoor side side of a dash panel 11 is equipped as drawing 14 and drawing 15 show the 4th operation gestalt of this invention and

show it to drawing 14 In addition to the bilayer layered product by which the nonwoven fabric 21 of high density was united with the configuration [ of the 1st operation gestalt ], i.e., front face of cellulose system base material 20, side, the high density layer 25 made from recycle material as an interlayer is formed in the interior of the cellulose system base material 20.

[0108] As recycle material used as the material of this high density layer 25, domestic wastes, such as grinding objects, such as industrial waste, such as edge material produced in an interior material production process, interior material after use, and a sheathing material, and not only automobile-related scrap wood but synthetic-resin mold goods, may be used. However, since a low consistency article like cloth does not have the effectiveness of the improvement in the engine performance, it is not suitable.

[0109] Moreover, recycle material is ground and used for a fixed form or an indeterminate form, and it is satisfactory even if powder-like recycle material mixes grinding size on the capacity of crushing equipment, although the range of 1-20mm is suitable.

[0110] Furthermore, in order to strengthen an adhesive property with the high density layer 25 which consists of a grinding object of the cellulose system base material 20 and recycle material, resin powder, hot melt (the shape of the shape of powder, a pellet type, and a chip), and the finishing agent 51 mentioned above may be added to recycle material.

[0111] Subsequently, as an approach of inserting the high density layer 25 in the pars intermedia of the cellulose system base material 20, as shown in drawing 15 (a), between the cellulose system original fabric mats M of two sheets, the high density layer 25 made from recycle material may be put, and cold press molding may be carried out after heating softening processing. From a container 60, this high density layer 25 sprinkles the grinding object 61 of recycle material, and is formed.

[0112] Moreover, as shown in drawing 15 (b), after depositing the charge 32 of an admixture which mixed absorption-of-sound / noise insulation component and the resin binder from the mixer 30 on a band conveyor 31 in the production process of the original fabric mat M, Sprinkle the grinding object 61 which ground recycle material from the container 60, and sprinkle the charge 32 of an admixture through a mixer 30 after that from the bottom, these are made to deposit continuously or gradually, and it is good also as a double layer mat of one sheet.

[0113] Furthermore, the cellulose system original fabric mat M may be set in a making machine just before a press, recycle material may be sprinkled, and press forming of the cellulose system original fabric mat M of one more sheet may be carried out further in piles. In addition, the high density layer 25 is biased toward an either side, and may be prepared even in the mid-position of the cellulose system base material 20.

[0114] And if the high density layer 25 is arranged to the cellulose system base material 20 interior in this way, the Mie wall noise insulation function by the dash panel 11, the high density layer 25, and three persons of the nonwoven fabric 21 of high density is obtained, and a good noise insulation function will be obtained, for example, without changing combination and the eyes of the cellulose system base material 20.

[0115] And by changing the metsuke amount of the high density layer 25 etc. suitably, adjustable [ of the noise insulation engine performance ] can be carried out, and this can also choose fine absorption-of-sound / noise insulation engine performance.

[0116] moreover, the configuration which abolished the nonwoven fabric 21 -- \*\*\*\*\* -- a nonwoven fabric 21 -- changing -- a film 22 -- or the configuration in which high density layer 20b was formed on the front face may be adopted.

## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the sectional view showing the configuration of the insulator dash for automobiles which applied the 1st operation gestalt of the sound insulating material for cars concerning this invention.

[Drawing 2] It is the chart Fig. showing 1 operation gestalt of the manufacture approach of the insulator dash for automobiles shown in drawing 1 .

[Drawing 3] It is the process explanatory view of a chart Fig. shown in drawing 2 .

[Drawing 4] It is the chart Fig. showing the modification of the lamination process in the chart Fig. shown in drawing 2 .

[Drawing 5] It is the chart Fig. showing the modification of the lamination process in the chart Fig. shown in drawing 2 .

[Drawing 6] It is the sectional view showing the configuration of the insulator dash for automobiles which applied the 2nd operation gestalt of the sound insulating material for cars concerning this invention.

[Drawing 7] It is the explanatory view showing the configuration of the film used for the insulator dash for automobiles shown in drawing 6 .

[Drawing 8] It is the chart Fig. showing the modification of one shaping of the original fabric mat and film in the insulator dash for automobiles shown in drawing 6 .

[Drawing 9] It is the chart Fig. showing the modification of one shaping of the original fabric mat and film in the insulator dash for automobiles shown in drawing 6 .

[Drawing 10] It is the explanatory view showing the forming cycle of the insulator dash for automobiles shown in drawing 6 .

[Drawing 11] It is the timing diagram Fig. of the shaping vertical mold in the forming cycle shown in drawing 10 .

[Drawing 12] It is the sectional view showing the configuration of the insulator dash for automobiles which applied the 3rd operation gestalt of the sound insulating material for cars concerning this invention.

[Drawing 13] It is the explanatory view showing the outline of the manufacture approach of the insulator dash for automobiles shown in drawing 12 .

[Drawing 14] It is the sectional view showing the configuration of the insulator dash for automobiles which applied the 4th operation gestalt of the sound insulating material for cars concerning this invention.

[Drawing 15] It is the explanatory view showing the lamination process of the original fabric mat and high density layer in the insulator dash for automobiles shown in drawing 14 .

[Drawing 16] It is the explanatory view showing the installation part of the sound insulating material for cars.

[Drawing 17] It is the sectional view showing the configuration of the conventional insulator dash for automobiles.

[Description of Notations]

10 Insulator Dash for Automobiles

11 Dash Panel

## 20 Cellulose System Base Material

20a Low consistency layer

20b High density layer

21 Nonwoven Fabric

22 Film

23 Nonwoven Fabric

24 Hot Melt

25 High Density Layer (Recycle Grinding Article)

30 Mixer

31 Band Conveyor

32 Charge of Admixture

33 Hot Blast Heating Furnace

34 Belt

35 Cut Cutting Edge

36 Hot Blast Heating Furnace

37 38 Metal mold for cold press molding

40 41 Vertical mold for shaping

40a, 41a A vacuum and compressed-air combination hole

50 Sprayer

51 Finishing Agent

52 Conveyance Roll

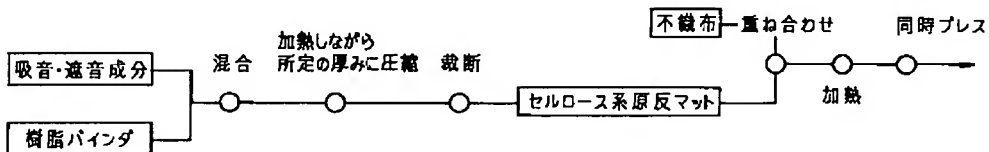
60 Container

61 Grinding Object (Recycle Material)

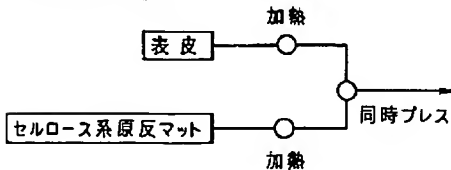
M Cellulose system original fabric mat

## DRAWINGS

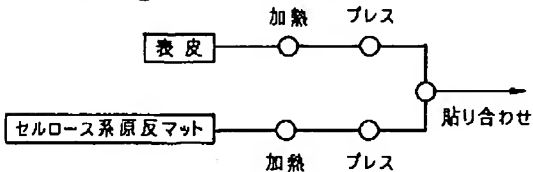
[Drawing 2]



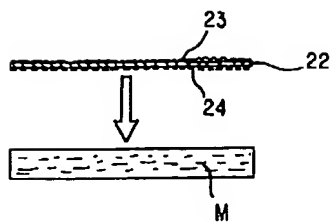
[Drawing 4]



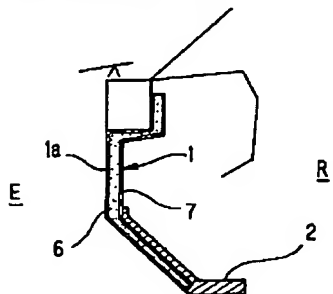
[Drawing 5]



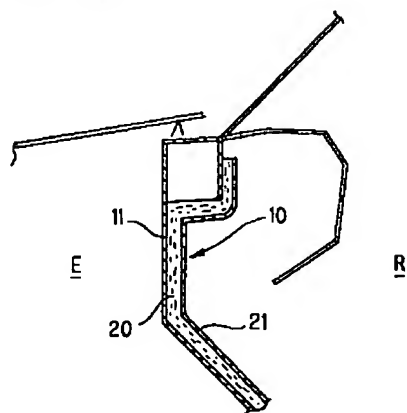
[Drawing 7]



[Drawing 17]



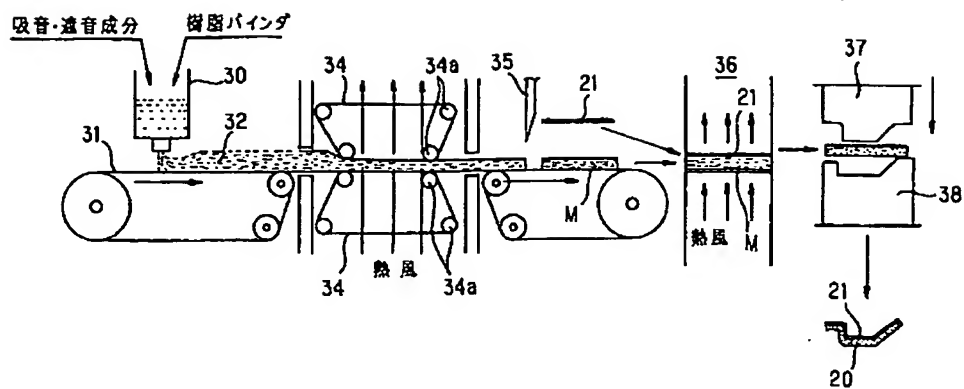
[Drawing 11]



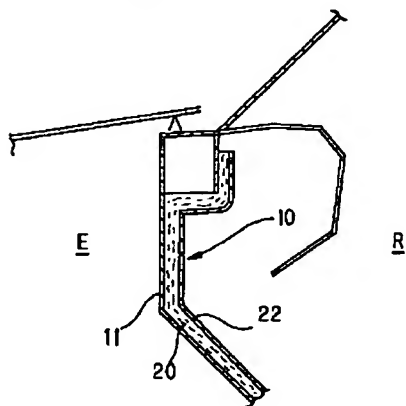
- |        |                 |                |
|--------|-----------------|----------------|
| 10     | 自動車用インシュレータダッシュ |                |
| 11     | ダッシュパネル         |                |
| 20     | セルロース系基材        | 40, 41 成形用上下型  |
| 20a    | 低密度層            | 40a, 41a 真空・   |
| 20b    | 高密度層            | 真空兼用孔          |
| 21     | 不織布             | 50 噴霧器         |
| 22     | フィルム            | 51 表面処理剤       |
| 23     | 不織布             |                |
| 24     | ホットメルト          |                |
| 25     | 高密度層(リサイクル粉砕品)  |                |
| 30     | 混合器             |                |
| 31     | ベルトコンベア         | 52 搬送ロール       |
| 32     | 混合材料            | 60 容器          |
| 33     | 熱風加熱炉           | 61 粉砕物(リサイクル材) |
| 34     | ベルト             | M セルロース系原反マット  |
| 35     | カッター            |                |
| 36     | 熱風加熱炉           |                |
| 37, 38 | コールドプレス成形用金型    |                |

[Drawing 3]

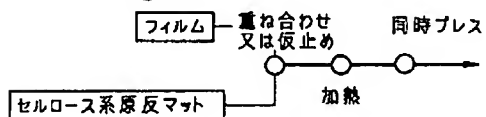




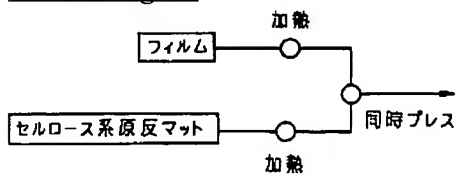
[Drawing 6]



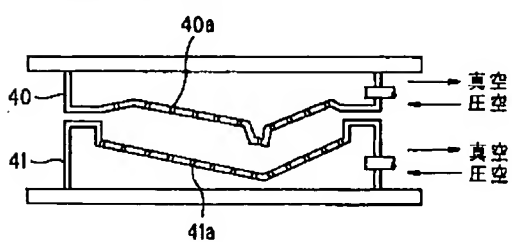
[Drawing 8]



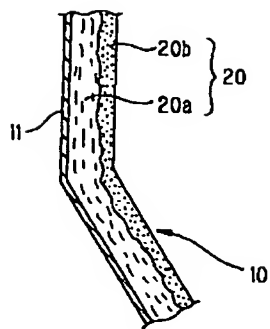
[Drawing 9]



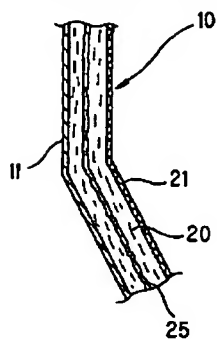
[Drawing 10]



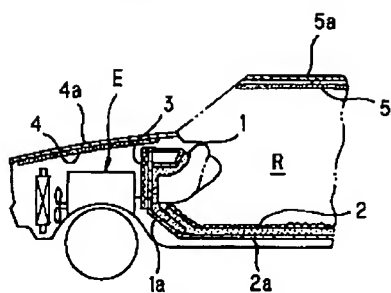
[Drawing 12]



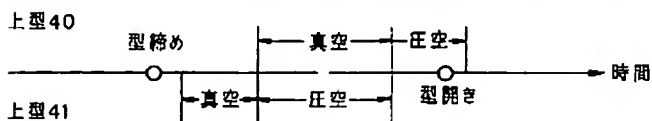
[Drawing 14]



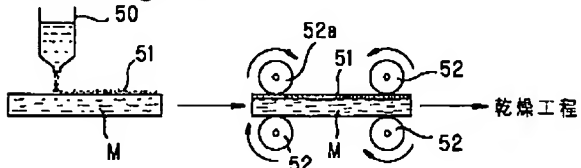
[Drawing 16]



<EMI ID=000018 HE=039 WI=049 LX=1400 LY=2200> [Drawing 11]



[Drawing 13]



[Drawing 15]

